On the Path from Frame to Schema
References and Abstracts
from Five Decades of Research

Edited by
Inger Bierschenk

2006   **Supplement**
2010   *Revised Edition*

Copenhagen University
Denmark

Lund University
Sweden

KOGNITIONSVETENSKAPLIG FORSKNING

Cognitive Science Research

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Abstract

On the Path from Frame to Schema is a publication that contains references and abstracts from five decades in the social sciences. It first appeared in 2006 as a non-numbered Supplement edition in the journal *Kognitionsvetenskaplig forskning – Cognitive Science Research* (0281-9864). It contains a review of a long term research commitment, which has taken place mainly in Sweden. The review concerns a number of researchers and departments, which over the years have been involved and contributed to the various research programs.

These programs have split into two distinct phases. The first one has it focus on studies of self-confrontation and the influence of personality variables on the perception of one-self as well as the evaluation of one's own actions in the context of micro-settings, closed circuit television and video-recorded information. The reported results have been presented in a number of publications, which include bibliographies and technical reports about the development of measurement devices according the psychometric criteria. Associated works of doctoral students have been included in this volume.

Another group of studies concerns the construction of an interactive behaviour simulator. In this case, the focus has been concentrated on event-action compounds. In the classical analytical tradition, multivariate statistics have been applied. Moreover, a number of investigations have been carried out in order to get an understanding of the way in which language based material could be transformed into a psychometric frame. With a link to concept and information processing approaches, a bridge was formed to the work going on within Cognitive Science. Together with the work of Gibson, a methodological reorientation started with an operationalisation of the Kantian schema and the development of a synthetic approach.

The synthetic approach has been advanced on the bio-kinetic hypothesis, which implies that the complexity and non-linear dynamics of natural language production can be approached on the basis of the Agent-action-Objective axiom. Experimentally it has been shown that the derived [AaO] units rotate and that AaO-governed rotations are including functions that can be imaged in real time provided that a dot, marking the state of a rotating string, can be attached to the string. In using filled and unfilled dots, it has been possible to demonstrate that the stepping function of the discovered mechanism is working within single [AaO] units. Through imaging the orientation of the dots on a sliding plane, it has been possible to demonstrate sliding over the A- and the O-domain and to measure the magnitude of the involved state changes. Finally a system of [AaO] units has the capacity to keep track of rotations and to assemble textual elements that temporarily are fitting into the structure, developed for a particular task.

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Preface to 1st Edition

During many years of empirical research within the computational framework of Educational psychology and the Computer-based processing of information, Bernhard Bierschenk has been deeply concerned with model construction and method development, which has accentuated problems of representing that which is worthwhile to know about the world we live in. In this course of scientific action, he did not circumvent problems usually referred to as the theoretical discipline of epistemology. On the contrary, they preoccupied more resources and power than could be expected within the context of empirical research programs.

Many years of scientific inquiry have been carried out at the Department of Educational and Psychological Research at Malmö School of Education. Financially, the research programs have been supported by grants partly from the Swedish National Board of Education, partly from the Humanities and Social Science Research Council of Sweden. The establishment of a theoretical and methodological new-orientation was promoted in 1980, when Bernhard was offered a full-time research position at Lund University, Faculty of the Social Sciences. Last but not least, a five-year grant (1996-2001) from the Danish Research Councils allowed for the methodological refinements and a deepening of the research reported in this volume.

In undertaking the editing my aim was to present abstracts from various writings along the path shifting from the "frame" to the "schema" approach. As it appears the relation between both is rather complicated and difficult to grasp, irrespective of one's field of research. The presentation will hopefully give the reader the full scope of what it means to proceed from one paradigm to another. I have integrated a great number of abstracts, which refer to either side, so hopefully the reader will pick up the relation, at least intuitively and in comparison understand the crucial criteria. To further highlight the advancement I have also included those meetings and symposia that may be helpful in tracing the pathway.

During four decades of research concerning the principles that allow for the study of structural stability, Bernhard Bierschenk has been able to develop a life-long research program, which has produced fundamental conditions for bridging the paradigmatic shift and to encourage others to co-operate and contribute with their own subject matter. Those collaborators at different stages will be found in the Index. I was one of them from the middle of the 1970's. From being an interested observer, I got the opportunity to become one of Bernhard's collaborators and research associates. Now as I have been at his side for more than three of the four reported decades, I have become fully aware of the uniqueness of his contribution to science. It is therefore with great respect for and deep gratitude to Bernhard that I now try to give a bibliographic account of this life-long program on the occasion of his 65th birthday.

April 2006
Inger Bierschenk

Comment to 2nd Edition

This revised edition has come about because of the open access policy of Lund University and the possibility it gives to provide the scientific community with a special online bibliography on a research program initiated and carried out by one of the university staff and his collaborators.

December 2010
Inger Bierschenk

1. On the Path

The path was initiated in 1966 when Bernhard Bierschenk got a stipend for studying the Swedish reform of the comprehensive school system of 1962. Some publications present and discuss school policy and educational research in Sweden. The initial phase is based on the frame hypothesis and comprises a major work on self-confrontation. In a number of publications, detailed experimental studies are presented concerning the effects of confrontation on information processing within the individual. These studies display classical treatments of measurement, highly developed and sophisticated statistical analysis and representation of the experimental outcomes.

Another research effort deals with the way in which behavioural researchers perceive and cognise the research process, especially in the stage of problem formulation and information search. Several publications deal with the organisation of information and corresponding theoretical assumptions, which have been treated in the context of the automatic computation as the main frame. With the beginning of an understanding of how to build a machine that in an algorithmic way can respond to cognitive inquiries, the development of methods and models for computer-based discourse analyses has been published, mainly during the 1970's.

But the frame hypothesis has also formed the basis for the development of a research program on information processing in the context of behavioural simulation. Video-recorded events as consequences of suggestions for action, given by experimental subjects, constitute the conditions for the suggestion of the proper next step in the development of a strategy.

A turn of the path was initiated in the beginning of the 1980's, which implied a radical reorientation towards the Agent-action-Objective (AaO) axiom. Since then, the basic focus is on the schema hypothesis. Consequently, the developed research strategy connects to current trends in the study of complex systems, non-linear dynamics and self-organisation with a special emphasis on "knowability". Hence the publications reflect a basic focus on textual pattern dynamics as outcome of a subtle interplay between intention and orientation, for which the schema approach provides the proper foundation. Conceived as systems, it has been shown throughout that the [AaO] units carry intentional cues and contain information about the produced orientation in their pattern dynamics. In particular the [AaO] units are embedding structurally the text producer's point of observation as well as his point of view.

The schema hypothesis refers to the invariant representation of textual movement patterns as well as to a coordination-free establishment of language spaces and their structures. Experimentally, it is demonstrated that natural language must be treated as a system that contains its own coordinates and that language exhibits periodic behaviour. Thus, text building behaviour has been studied and discussed as a phenomenon that obeys natural law, since text develops evolutionary. Hence, the focus has been on natural language production as a means for the establishment of cognitive functions in the form of state attractors. Furthermore, it has been shown that the angular articulation of some word models and their geometric description carry more ecological validity than can be reflected through all methodological distinctions of the classical frame approach.

The references listed are for the most part covered by the USA-based ERIC Document Reproduction Service and some by PsycINFO as well as by ZPID (The German Centre for Documentation and Information in Psychology) at the University of Trier, Germany. An Index is given at the end of the list. The abstracts are produced by the authors of the publications.

This 2nd edition contains a few additional publications that were not available at the time of the first edition or were in progress. The references now include contributions until 2009. Further, the ED numbers have been added.

2. Period: 1965-1969

2.1 Introductory Remarks

During the 60's, the general opinion concerning public education and in particular school policy was focused upon the Swedish reform of the entire educational system, beginning with the comprehensive school. This work was conceived of exemplary concerning preparation and scientific underpinnings. Detailed committee reports and public discussions smoothed the way towards broad acceptance of the workload following the introduction of the reformed school plane of 1964. In the spirit of Social Engineering the goal was to change the whole society into a social-democratic and post-industrial civilisation. After extensive visits in 1965 and 1966 to schools all over the country and intensive terms of study in educational seminars at the Schools of Education in Göttingen, Germany and Malmö, Sweden, a number of reports became available in 1967/68 for a contribution to the ongoing discussions in Germany.

1. Bierschenk, B. (1968). Theorie und Praxis in der Oberstufe der schwedischen Grundschule (Theoretical and practical aspects of the Swedish comprehensive school, upper level). *Educational and psychological interactions,* No. 21; 0070-9263. (PsycLIT AN: 1968-09393-001)

Abstract
The report presents a descriptive study of the educational system in Sweden with special emphasis on the upper level of the comprehensive school. An attempt is made to survey the goals and the realisation of the goals in the practical school situation. Thereby, the focus has been directed upon the attempts being made to adapt the school to the demands of a quickly developing modern society.

2. Bierschenk, B. (1968). *Theorie und Praxis in der Oberstufe der schwedischen Grundschule (Theoretical and practical aspects of the Swedish comprehensive school, upper level, rev. ed.).* Hannover: Schroedel Verlag. [Original published in 1968 in *Educational and psychological interactions,* No. 21; 0070-9263.]

3. Bierschenk, B. (1968). Die Zentralorganisation schwedischer Schüler (SECO) (The central organisation of Swedish students). In W. Bögli (Ed.), *Beiträge zur schwedischen Schulreform* (pp. 206-226). Weinheim: Beltz.

Abstract
Compared to all other countries, the self-governing organisation of the Swedish Student Union has a unique position concerning its influence on Administration, Government and Parliament. Through the Teacher Union's strike of 1966, its activities have become known in Germany. In particular, the students' ability of organising lessons over an extended period of time has contributed to their popularity among some educators in Germany. Furthermore, all committee work of some import is passed to the Student Union for consideration and comments. Hence, Swedish student seem to be involved in all central question of import for external and internal work organisation. Many of their opinions have been integrated into Parliament decisions. Finally, Swedish students participate in teacher conferences on a regular basis and thereby contribute to educational decision making as well as to the reformulation of the curriculum. In principle, they are working for the continuing reformation of the Swedish School system.

4. Iben, G., & Bierschenk, B. (1968). Schulpsychologie und Schülerpflege (Educational psychology and counselling). In W. Bögli (Ed.), *Beiträge zur schwedischen Schulreform* (pp. 110-129). Weinheim: Beltz.

Abstract
This report gives some information about the possibilities and problems, which have been observed during an excursion to Sweden, jointly organised by the Department of Comparative Education, University of Marburg and the Department of Education at the University of Hamburg. Two different forms can be discerned. One concerns the provision of school psychology in Gothenburg and the other relates to parts of student care within the comprehensive school system of Uppsala. Some information about the providers (institutes) is reproduced.

5. Bierschenk, B. (1968). Die Zentralorganisation schwedischer Schüler (SECO) (The central organisation of Swedish students, rev. ed.). In Å. Bjerstedt, B. Bierschenk, & H. Löfgren (Eds.), *Probleme der Schuldemokratie: Forschungsaufgaben und schwedische Ausgangspunkte* (pp. 8-22). *Didakometrie und Soziometrie*, No. 5; 0046-5020. [Original published in 1968 in W. Bögli (Ed.), *Beiträge zur schwedischen Schulreform* (pp. 206-226). Weinheim: Beltz.]

6. Bierschenk, B. (1969). Television as a technical aid in education and in educational and psychological research: A bibliography. *Didakometry,* No. 24; 0046-0230. (ED 037 060; PsycLIT AN: 1970-07360-001)

Abstract
The report is a bibliographic account concerning television as a technical aid in education and in pedagogical and psychological research. The main stress in this bibliography lies on English and German dissertations from the period 1962-1969. To some extent other published materials in the English language are also included.

3. Period: 1970-1979

3.1 Introductory Remarks

After comprehensive policy studies of the educational system in Sweden and teacher training as well, the major work of the 70's was concerned with the study of (1) the effect of externally mediated self-confrontation by means of closed-circuit television and video-tape recording. The main meeting point of this work is founded on perception and evaluation of the self in social interaction. During this period the publications report a detailed experimental study of how self-confrontation effects information processing within the individual. A heavy stress on multivariate statistical analyses and advanced statistical testing is characterising the publications of this period. Related works include a follow-up study (two weeks as well as two years later), which have made it necessary to move forwards to further refinements in the multivariate procedures and the processing of the relations between a comprehensive battery of personality variables and various characteristics of the subjects' own perception and evaluation.

With respect to different situations, other studies were concentrated on personality influences in decision-making and cognitive change. The main stress on models of information processing had as its effect a theory-based simulation of interpersonal relations. The simulations were based on the presentation of video-recorded events as consequences of suggestions for action given by experimental subjects. Depending on the kind of decision made by a particular subject, various new events are displayed. The detailed analyses of various interaction processes seem to have high theoretical interest and potential value for the processing of information in social contexts.

For several years, efforts for dealing with the way in which researchers perceive and cognize the research process, especially in the stage of problem formulation and information search, have resulted into a number of studies of the function of locally based I&D-systems. The development of models for the representation of highly abstracted information in man and computer became part of the laboratory work. Several publications deal with theoretical and methodological aspects of these studies. Methodological innovations play an important role here, and are especially oriented towards developing methods and models for computer-based discourse analyses.

7. Bierschenk, B. (1970). Die Lehrerhochschule und das pädagogisch-psychologische Forschungsinstitut an der Lehrerhochschule in Malmö: Organisation, Ausbildung und Forschung (The school of Education and its Department of Educational and Psychological Research in Malmö: Organisation, training and research). *Didakometrie und Soziometrie,* No.7; 0046-5020.

Abstract

The report is divided into five subparts: Part 1 gives a general presentation of the training and research organisation of the School of Education and its functions and relations in the educational system of Sweden. Part 2 gives a description of the organisation and goals of the several training sections at the School of Education and of the training schools connected with the School of Education. Part 3 contains a survey of the organisation, function and research activities of the Department of Educational and Psychological research at the School of Education in Malmö. Part 4 gives a description of current research projects. Part 5 contains an updated list of departmental publications.

8. Bierschenk, B. (1971). Television as a technical aid in education and in educational and psychological research: A bibliography (continued). *Didakometry,* No. 29; 0046-0230. (ED 049 644; PsycLIT AN: 1971-29811-001)

Abstract

The report is a supplementary bibliographic account to the report, published 1969, in this series, namely *Didakometry,* No. 24, concerning television as a technical aid in education and in pedagogical and psychological research. The main stress in this report lies on English dissertations from the period 1968-1970. To some extent other published materials in the English language are also included.

9. Bierschenk, B. (1971). Television as a technical aid in education and in educational and psychological research: A bibliographic account of German literature. *Didakometry,* No. 31; 0046-0230. (ED 053 661)

Abstract

The report is a bibliographical account of German literature on television as a technical aid in education and in pedagogical and psychological research. The bibliography covers publications produced between 1960 and 1970.

10. Bierschenk, B. (1971). Television som tekniskt hjälpmedel i utbildning och pedagogisk-psykologisk forskning: En bibliografi (Television as a technical aid in education an in educational and psychological research: A bibliography. *Pedagogisk dokumentation*, No. 2; 0346-5039. (ED 052 616)

Abstract

This report is a bibliographical account concerning television as a technical aid in education and in pedagogical and psychological research. The report contains a summary of three special bibliographical accounts: Part 1 includes English materials published in the years 1962 -1968. Part 2 is a continued account and contains English materials up to now. Part 3 includes publications in German, published in the years 1960-1970.

11. Bierschenk, B. (1971). Att strukturera olika datanivåer med hjälp av faktoranalystekniker (Structuring various data levels by means of factor-analytic techniques). *Kompendieserien*, No. 12; 0346-5012.

Abstract
This report gives an account of some problems, connected with factor analytic data processing. The presentation is of a non-technical kind and concentrated on the description of data processing on several levels. Furthermore, the features of the models of analysis are described, however without an attempt to provide a more systematic and complete presentation. For a more thorough study, the complexity of the subject would require a type of disposition provided in Child, D. (1970). The essentials of factor analysis (SBN 03 910078 8). The reader, who would like to deepen his understanding of factor analytical approaches, is referred to this book as well as books and articles of the list of references in the compendium.

12. Bierschenk, B. (1971). Självkonfrontation via intern television i lärarutbildningen: Bakgrund, experiment, experimentupplevelse (Self-confrontation via closed circuit television in teacher training: Background and experiments). *Pedagogisk-psykologiska problem*, No. 154; 0346-5004. (PsycLIT AN: 1972-32220-001)

Abstract
An attempt to modify perception and evaluation of student teachers with the aid of self-confrontation mediated with video recordings on one hand and conventional tutoring on the other is the subject of this report. Background to the experiment, a detailed description of the layout and a presentation of the measuring instruments are given together with evaluation of the internal and external validity of the taken approach.

13. Bierschenk, B. (1971/1972). Att mäta subjekt-objekt relationer i externt förmedlade självkonfrontationsprocesser via intern television: Presentation av ett kategorisystem (The measurement of subject-object relationships in externally mediated self-confrontation processes via closed circuit television: Presentation of a category system. *Testkonstruktion och testdata*, Nr. 6 (rev. ed.). School of Education, Malmö, Sweden.

Abstract
This report contains (1) a discussion of general methodological problems in content analyses, (2) a description of the applied content analysis technique, (3) an estimation of the agreement of judges in determining and extracting the basic units of the analysis and (4) an estimation of the coder agreement in coding these units. The coding rules and the preliminary version of the category system are given in appendices.

14. Bierschenk, B. (1972). Självkonfrontation via intern television i lärarutbildningen: Analyser av lärarkandidaters självbedömning (Self-confrontation via closed circuit television in teacher training: Analyses of student teachers' self-assessment. *Pedagogisk-psykologiska problem*, No. 160; 0346-5004. (PsycLIT AN: 1973-11837-001)

Abstract
This report contains a description and discussion of self-assessment data obtained from student teachers, who have participated in a self-confrontation experiment. The measurement scale: Assessment and Evaluation Schedule, has been especially devised for this experiment. The report includes a discussion of validity and reliability problems. The self-assessment data have been analysed by means of ANOVA which has been carried out in 3 steps: (1) analysis of the structure of the F-tests, (2) precision and power analyses of the significant results, and (3) post hoc analyses. Detailed information is given in appendices.

15. Bierschenk, B. (1972). Självkonfrontation via intern television i lärarutbildningen: Analyser av pedagogiska experters bedömningar (Self-confrontation via closed circuit television in teacher training: Analyses of assessments of educational experts). *Pedagogisk-psykologiska problem*, No. 164; 0346-5004. (PsycLIT AN: 1973-11834-001)

Abstract
The classroom behaviour of student teachers has been recorded on videotape. Educational experts have assessed these videotaped materials. This report contains a description and the conclusions reached. The assessment is analysed and discussed at the item level and at the level of the six subject-object categories constituting the Assessment and Evaluation Schedule. The observations have been analysed by means of ANOVA which has been carried out in three steps: (1) analysis of the structure of the F-tests, (2) precision and power of the significant results, and (3) post hoc analyses. Detailed information is given in appendices.

16. Bierschenk, B. (1972). Självkonfrontation via intern television i lärarutbildningen: Analyser av lärarkandidaters självbedömning och pedagogiska experters bedömningar (Self-confrontation via closed circuit television in teacher training: Analyses of student teachers' self-assessment and of the assessments of educational experts). *Pedagogisk-psykologiska problem*, No. 165; 0346-5004. (PsycLIT AN: 1973-11836-001)

Abstract
This report contains analyses of the results of student teachers' self-assessment and the assessment by pedagogical experts on videotaped protocol material. The data have been analysed by means of ANOVA and canonical correlations. Further, the ANOVA has been carried out in three steps: Analysis of (1) structure of the F-tests, (2) precision and power and (3) post hoc analyses. Canonical correlations have been analysed with regard to (1) significant bi-variate relations, (2) the relations between components, and (3) the interpretation of these relations. Detailed information is given in the appendices.

17. Bierschenk, B. (1972). Självkonfrontation via intern television i lärarutbildningen: Resultat, implikationer och rekommendationer (Self-confrontation via closed circuit television in teacher training: Results, implications and recommendations). *Pedagogisk-psykologiska problem*, No. 170; 0346-5004. (PsycLIT AN: 1973-11836-001)

Abstract

This report contains a summarised description of the experimental design, results and implications of separately published analyses. The aim of the investigation has been to study the effects of traditional tutoring and self-confrontation via closed circuit television and video-recording on student teachers' self-assessment. In addition, the report contains recommendations for further research and for further analyses of data already collected.

18. Bierschenk, B. (1972). Självkonfrontation via intern television i lärarutbildningen: Test och testdata (Self-confrontation via closed circuit television in teacher training: Tests and test data). *Testkonstruktion och testdata*, No. 12. School of Education, Malmö, Sweden.

Abstract

This report presents tests and test data, earlier published as Appendices to interim reports in the School of Education's series: *Pedagogisk-psykologiska problem*, 0346-5004. [The main aim of these Appendices is to provide easy access to more detailed information about the investigation reported in *Studia psychologica et paedagogica*, series altera 18; 0346-592.]

19. Bierschenk, B. (1972). Self-confrontation via closed circuit television in teacher training: Results, implications and recommendations (extended with test data). *Didakometry,* No. 37; 0046-0230. (ED 070 293; PsycLIT AN: 1973-05307-001). [Extended summary of the investigation reported in *Studia psychologica et paedagogica*, series altera 18; 0346-592.]

Abstract

An experimental study was carried out at the Malmö School of Education in 1969 and 1970 for the purpose of studying the effects on the self-assessment of student teachers of, firstly, externall**y** mediated self-confrontation processes (via closed-circuit television and video-recording), and secondly, dyadic confrontation processes (in the form of traditional tutoring). Detailed reports on the background, design and result of the experiment have been presented in Swedish. The present report gives a brief description of the design, the results, and some implications of the separate analyses. On the basis of the experimental results, general recommendations are given for continued research on closed circuit television techniques. Finally, an outline is given of some important tasks for analysis, for which data have already been collected.

20. Bierschenk, B. (1972). Selbstkonfrontation durch internes Fernsehen in der Lehrerausbildung: Resultate, Implikationen und Empfehlungen (Self-confrontation via closed circuit television in teacher training: Results, implications and recommendations). *Didakometrie und Soziometrie,* No. 12; 0046-5020. [This series of experiments in externally mediated self-confrontation was presented in W. Zifreund (Chair), *Analysis of interactions.* Symposium conducted at the First International Congress of Microteaching (1972, April), Tübingen, Germany.]

Abstract

This report contains a summarised description of the experimental design, results and implications of separately published analyses. The aim of the investigation has been to study the effects of traditional tutoring and self-confrontation via closed circuit

television and video-recording on student teachers' self-assessment In addition, the report contains recommendations for further research and for further analyses of already collected data.

21. Bierschenk, B. (1972). Självkonfrontation via intern television i lärarutbildningen (Self-confrontation via closed circuit television in teacher training). *Studia psychologica et paedagogica*, series altera 18; 0346-592. [For an extended summary, see: *Didakometry,* No. 37; 0046-0230.]

22. Bierschenk, B. (1972). An English digest: Self-confrontation via closed circuit television in teacher training: Results, implications and recommendations for further research (*Reprint,* Department of Educational and Psychological Research, School of Education, No. 119). (PsycLIT AN: 1973-05308-001). [Abstract, see: *Didakometry,* No. 37; 0046-0230.]

Abstract
An experimental study was carried out at the Malmö School of Education in 1969 and 1970 for the purpose of studying the effects on the self-assessment of student teachers of, firstly, external**l**y mediated self-confrontation processes (via closed-circuit television and video-recording), and secondly, dyadic confrontation processes (in the form of traditional tutoring). Detailed reports on the background, design and result of the experiment have been presented in Swedish. The present report gives a brief description of the design, the results, and some implications of the separate analyses. On the basis of the experimental results, general recommendations are given for continued research on closed circuit television techniques. Finally, an outline is given of some important tasks for analysis, for which data have already been collected.

23. Bierschenk, B. (1972). Att söka litteratur med hjälp av datorer (Searching for literature with the aid of computers). *Pedagogisk dokumentation,* No. 10; 0346-5039.

Abstract
Scientific communication presumes a well functioning information and documentation system. Information retrieval systems have been designed for making possible rapid and precise answers to inquiries. This report includes (1) a short survey of international and national documentation activities, (2) a description of rules and criteria to be used and the way these can be applied in an information retrieval system, and (3) some empirical results, identifying the needs for information and the uses to which the information will be put.

24. Bierschenk, B. (1973). Handledning för rapportering av beteendevetenskaplig forskning (A guide for reporting behavioural science research). *Pedagogisk dokumentation,* No. 18; 0346-5039.

Abstract
To enable the examination and evaluation of the quality of scientific publications and research funding, researchers should rely heavily on the principles of behavioural research for conducting and reporting empirical studies. In this report both general rules and suggested conventions have been compiled, i.e. (1) general principles for designing and evaluating behavioural research, (2) suggestions for principles to guide the researcher in preparing scientific reports for publication, and (3) conventions for

typing the report together with rules for correcting the manuscript. In addition, the report contains recommendations for abbreviations of (1) German and (2) English terms together with (3) names of journals and surveys.

25. Bierschenk, B. (1973). Datorbaserad litteratursökning (Computer-based search for literature). *Pedagogisk orientering och debatt,* No. 44; 0479-7736. [Original work published in 1972 in *Pedagogisk dokumentation,* No. 10; 0346-5039.]

26. Bierschenk, B. (1973). Television som tekniskt hjälpmedel i utbildning och pedagogisk-psykologisk forskning: En bibliografisk redovisning och utvärdering av manuell och datorbaserad litteratursökning (Television as a technical aid in education an in educational and psychological research: A bibliographic account and explorative analysis of computer-based search for literature). *Pedagogisk dokumentation,* No. 19; 0346-5039.

Abstract
Information retrieval systems have been designed for making possible rapid and precise answers to queries. This report contains an analysis and discussion of the applied strategy for manual and computer-based search for literature on the subject: uses of closed circuit television in the behavioural sciences. The results of the manual search have been published 1969 in the series [*Didakometry,* No. 24; 0046-0230.], but the result of the computer-based search is presented in this report.

27. Bierschenk, B. (1973). Television som tekniskt hjälpmedel i utbildning och pedagogisk-psykologisk forskning: En bibliografisk redovisning, 1971-1974 (Television as a technical aid in education an in educational and psychological research: A bibliographic account, 1971-1974). *Pedagogisk dokumentation,* No. 31; 0346-5039.

Abstract
This report is a fifth bibliographic account of literature concerning television as a technical aid in education and in educational and psychological research and contains materials published during the period 1971 to 1974. The references are classified according to 8 main categories, each having 4 subdivisions. The bibliography contains references, which are a result of computer search in the files of ERIC, ISI and SSCI. Dissertation Abstracts International and research literature available have been searched for relevant references. Two indexes have also been included, namely:
(1) an index, which lists the accepted abbreviations of the titles of periodicals, and
(2) an index which is an alphabetically arranged list of authors.

28. Annerblom, M.-L. (1974). En impressionistisk innehållsanalys av intervjuer med forskare på pedagogiska institutioner i Sverige (An impressionistic analysis with researchers in departments of education in Sweden). *Pedagogisk-psykologiska problem,* No. 255; 0346-5004.

Abstract
This report, based on an interview study, presents the views of forty researchers at departments of education on the scientific process. The technique used in this investigation is impressionistic, and the analysis includes: motivation, information search, relationships, influences on project plan, interest spheres, personal situation,

program budgeting and practical problems, frame of reference, suggested projects and methodology.

29. Bierschenk, I. (1974). Konstruktion av ett regelsystem för en datorbaserad innehållsanalys av intervjutext: Preliminärmanual och några utprövningsresultat (Construction of rules for a computer-based content analysis of interview texts: A preliminary manual and some evaluation data). *Testkonstruktion och testdata*, No. 25. School of Education, Malmö, Sweden.

Abstract

This report contains a description of a technique for a computer-based content analysis of interview text. Some steps in the development of a rule system for coding are reported. The evaluation of a preliminary system of rules is described and evaluation data are presented. Furthermore is integrated an extensive control of punching and punch cards for the purpose of attaining a perfect material. The presentation of the work, carried out so far, is preceded by a linguistic discussion.

30. Bierschenk, B. (1974). Självkonfrontation via intern television i lärarutbildningen: Lärarkandidater bedömer egna videobandade lektioner – en uppföljningsstudie (Self-confrontation via closed circuit television in teacher training: Student teachers assess their own videotaped micro-lessons – a follow up study). *Pedagogisk-psykologiska problem*, No. 244; 0346-5004. (PsycLIT AN: 1975-24002-001)

Abstract

This report contains a description and discussion of self-assessment data obtained from student teachers, partly as a result of repeated self-confrontation experiences during a confrontation experiment, partly as a result of reassessments six weeks respectively two years after they had participated in the self-confrontation experiment. The data have been analysed by means of ANOVA and canonical correlation analyses. Also assessments obtained from pedagogical experts have been used as a criterion in these analyses.

31. Bierschenk, B. (1974). Perceptual, evaluative and behavioural changes through externally mediated self-confrontation. *Didakometry,* No. 41; 0046-0230. [Article prepared for UNESCO and reproduced with its permission. © UNESCO 1974.] (ED 092 154; PsycLIT AN: 1974-33116-001)

Abstract

This report describes the development and application of the idea of microteaching in research and education. It presents a cybernetic model for a systematic and controlled study of the way in which the individual makes use of different feedback devices for self-control and self-direction. The model is applied in an examination of an extremely comprehensive collection of research literature. The result of the investigation is studied with regard to its significance for a person's ability to make use of the self-information procured via techniques for externally mediated self-confrontation such as closed circuit television, in modifying his own behavior. The main conclusions reached are (1) that externally mediated self-confrontation via CCTV is a most important factor in connection with training programs and therapeutic treatment and (2) that micro-setting models have been and still are without theoretical foundation,

which means among other things that despite extensive studies, it is still uncertain how much significance these models should be allotted.

32. Bierschenk, B. (1974). Perception, strukturering och precisering av pedagogiska och psykologiska forskningsproblem på pedagogiska institutioner i Sverige (Perception, structuring and definition of educational and psychological research problems at departments of education in Sweden). *Pedagogisk-psykologiska problem*, No. 254; 0346-5004. (PsycLIT AN: 1975-28645-001)

Abstract

This report presents and motivates the theoretical frame of reference and choice of research strategies and methods in a project on research planning. It contains (1) a theoretical model and (2) empirical data concerning the initial phase of the research process. A model, based on principles of general systems theory and a psychology of information, is described and the design of an interview study and its realization is reported. Problems of data processing and data analysis are discussed. A model for the development of a computer-based content analysis technique is outlined. Descriptive statistics from an assessment schedule, which was presented to researchers during the interview, are presented.

33. Bierschenk, B. (1974). A computer-based content analysis of interview data: Some problems in the construction and application of coding rules. *Didakometry,* No. 45; 0046-0230. (ED 110 045; PsycLIT AN: 1975-22130-001). [This work was presented as 'Computerisierte Inhaltsanalyse von Texten: Beschreibung einer Prozedur' (Computer-based content analysis of texts: Description of a procedure) at the *IPN-Kolloquium*, organised by K. Frey, (1975, January), Kiel, Germany.]

Abstract

This report discusses the development of a technique for a computer-based content analysis It presents a flowchart of different stages in the designing of an *Ana*lysis of *Con*cepts by *Da*ta-processing. The acronym ANACONDA is the name that has been given to this technique. A condensed preliminary version of ANACONDA is presented and empirical results are shown from the application of the technique by independent coders to test materials. The entire test materials have been checked, in order to obtain a faultlessly punched and coded text. Empirical data are presented from this check. In conclusion the next steps are discussed: (1) scaling of qualifiers and (2) construction of registers.

34. Bierschenk, B. (1974). En modell för ett interaktivt informations- och dokumentationssystem (A model for an interactive information and documentation system). *Pedagogisk dokumentation,* No. 26; 0346-5039.

Abstract

This report is based on studies of literature and the writer's own experiences of the use of computer-based information and documentation systems. The report presents principles for the development of an interactive, self-regulating and self-controlling information and documentation system. Based on a system theoretical point of view a model for a realisation of an information and documentation system is outlined. Functional characteristics are discussed. The information searcher is placed in the

centre of the discussion. Expected trends of developments are focused upon. As a summary a suggestion for an organisation is given.

35. Berg, M. (1974). Reliabilitetsprövning av en metod för innehållsanalys av intervjutext (Reliability testing of a method of content analysis applied to interview texts). *Testkonstruktion och testdata*, No. 26. School of Education, Malmö, Sweden.

Abstract

In a research project on search and steering strategies in educational and psychological research planning, interviews with researchers working in departments of educational and psychological research are being analysed. The present report deals with the first step in developing a computer-based content analysis control of inter-coder agreement in syntactic-concept based coding of interview materials. The report discusses the actual inter-coder agreement and proposes directions for further development of the coding rules.

36. Bierschenk, B. (1975). Self-confrontation via closed circuit television in teacher training: Student teachers assess their own videotaped micro-lessons: A follow up study. *Didakometry,* No. 50; 0046-0230. (PsycLIT AN: 1976-05414-001)

Abstract

Student teachers have been confronted with their own video-recorded micro-lessons as part of a self-confrontation experiment. This report presents the students' repeated assessments of subject-object relations both during the experiment, and six weeks and two years after the experiment. The data have been analysed by means of ANOVA and canonical correlation analyses. Also the assessments obtained form pedagogical experts have been used as a criterion in theses analyses. Identification experiences and self-evaluation were examined for differences in level. The assessments made by the student teachers with an assessment and evaluation schedule were examined both for differences in level and for structural relations and similarities. One part of the self-confrontation experiment consisted of assessment of the video-recorded materials by educational experts. The experts' assessments have been used in studying whether and to what extent the teacher training has firstly, influenced the student teachers' assessments in relation to those made by the experts and secondly, led to larger structural relations or similarities between the student teachers' and experts' assessments of the video-recorded materials. Finally, a study has also been made of the student teachers' repeated rankings of a number of alternative tutors.

37. Bierschenk, B. (1975). Externally mediated self-confrontation: The influence of personality variables on the perception and evaluation of subject-object relations. *Educational and psychological interactions,* No. 52; 0070-9263. (ED 147 312)

Abstract

In a self-confrontation experiment, student teachers have been put through an extensive test battery containing personality tests, cognitive tests and attitude tests. In this report an analysis is presented of the influence of personality on the student teachers' perception and evaluation during confrontation with their own video-recorded micro-lessons. Using a number of multivariate models for data analysis, prediction problems and relations between the content of different groups of variables were studied. The student teachers' perception can best be predicted by means of

personality variables that define an extroversion syndrome, social plasticity and child-centeredness. The student teachers' evaluation can best be predicted by means of personality variables defining a syndrome, consisting of a mixture of emotionality and sensitivity variables.

38. Bierschenk, I. (1975). Datorbaserad innehållsanalys: Teoretiska och praktiska överväganden (Computer-based content analysis: Theoretical and practical considerations). *Pedagogisk-psykologiska problem*, No. 283; 0346-5004.

Abstract
This report describes a Swedish contribution to computer-based content analysis research. The method is compared to international conventions regarding the treatment of text for computer-based analysis. An account is given of how a dictionary can be built up on the basis of the Swedish language. The coding of the text is based on a theory about thought structures and the report describes the way in which this theory can be converted into a system for coding concepts and relations. The system of rules is then put in relation to a theory about the simulation of cognitive and emotional structures. The capacity of the system of rules for analysis on different hierarchical levels is presented.

39. Skog-Östlin, K. (1975). Några personlighetsvariablers betydelse vid lärarkandidaters perception och värdering av egen undervisning (The role of some personality variables in teacher-candidates' perceptions and evaluations of their own teaching). *Pedagogisk-psykologiska problem*, No. 276; 0346-5004.

Abstract
The purpose of this report has been to describe in detail eighteen tests of a battery of personality tests, administered in a self-confrontation experiment. The results indicate that in general personality variables, especially those mirroring an interest in one's self, play a major roll in perception and evaluation of one's own teaching.

40. Bierschenk, B. (1975). Att söka information via Social Sciences Citation Index (SSCI) (Searching for information with the aid of Social Sciences Citation Index). *Kompendieserien*, No. 15; 0346-5012.

Abstract
Social Sciences Citation Index is a new information system. It differs in several aspects from traditional bibliographic aids used by researchers in the social sciences. This compendium contains a presentation of SSCI and a description of some search problems in order to show how SSCI should be used in a systematic search for scientific information.

41. Bierschenk, B. (1975). Processanalys och beteendeträning i lärarutbildningen: Simulering av interpersonella relationer (SIR) (Process analysis and the training of behaviour in teacher education: Simulation of interpersonal relations (SIR). *Pedagogiska hjälpmedel*, No. 19; 0346-5047. [This work has been presented with a paper on 'Simulating interactive behaviour strategies' at the 18th *Meeting of the Arbeitsgemeinschaft für Experimentelle Psychologie,* (1976), Marburg, Germany.]

Abstract

The report presents a research program, the purpose of which is to study (1) the development of the individual's self-cognition and competence in handling interpersonal relations, (2) the individual's sensitivity in observing the course of an event and ability to develop flexible strategies of behaviour in interactions with others. A model for the simulation of interactive behaviour is outlined. The model is based on three behavioural principles and has guided the preliminary construction of a simulator of interactive teacher-student behaviour. For the purpose of illustration some empirical results are also given. It is hoped that the idea suggested will eventually lead to the development of a new educational aid for the benefit of teacher training.

42. Bierschenk, B. (1975). *Los cambios perceptivos, evaluativos y conductales mediante la autoconfrontacion con la imagen externa (Perceptual, evaluative and behavioural changes through externally mediated self-confrontation).* Paris: UNESO, Instituto Nacional de ciencias de la Educación. [Original published in *Didakometry,* No. 41; 0046-0230.]

43. Bierschenk, B. (1975). Forskningsplanering ur mikroekologiskt perspektiv (Research planning from a micro-ecological point of view. *Pedagogisk dokumentation*, No. 41; 0346-5039. [This work was presented as 'Determinanten bei der Findung und Auswahl von neuen Forschungsprojekten im Bildungsbereich: Erste Ergebnisse einer empirischen Untersuchung in Schweden' (Determinants in the finding and selection of new research projects in education: First results of an empirical investigation in Sweden) at the *IPN-Kolloquium*, organised by K. Frey, (1975, January, Kiel), Germany.]

Abstract

This report contains a summary of an interview study. The investigation has been carried out with the aim to explore the initial phase of the research process. According to a model, based on a theory of general systems, results are presented concerning the perception, structuring and definition of educational and psychological research problems. The results are summarised in accordance to the resources and constraints, which steer research planning.

44. Bierschenk, B. (1975). Prozessanalyse und Verhaltenstraining in der Lehrerausbildung: Simulierung von interpersonellen Relationen (SIR) (Process analysis and the training of behaviour in teacher education: Simulation of interpersonal relations (SIR)) *Didakometrie und Soziometrie,* No. 15; 0046-5020. [This work was in a paper on the construction of an interactive behaviour simulator at the 23rd Meeting of *Arbeitsgruppe für Empirische Pädagogische Forschung (AEPF)*, 1976 in Bochum, Germany.]

Abstract

This report presents a research program, the purpose of which is to study (1) the development of the individual's self-cognition and competence in handling interpersonal relations, (2) the individual's sensitivity in observing the course of an event and ability to develop flexible strategies of behaviour in interactions with others. A model for the simulation of interactive behaviour is outlined. The model is based on the three behavioural principles and has guided the preliminary construction of a simulator of interactive teacher-student behaviour. For the purpose of illustration some

empirical results are also given. It is hoped that the idea suggested will eventually lead to the development of a new educational aid for the benefit of teacher training.

45. Frost, G. (1975). Lärarbeteenden och elevreaktioner: Beskrivning och utprövning av två i beteendevetenskapliga teorier förankrade simulatorer (Teacher behaviours and pupil reactions: A description of two simulators anchored to behavioural theories). *Pedagogisk-psykologiska problem*, No. 279; 0346-5004.

Abstract
This report presents two simulators anchored to behavioural theories and based on the interaction between teacher behaviours and video-recorded pupil reactions. The purpose is to see whether student teachers use strategies when choosing a course of action and whether they then follow these strategies flexibly or in a stereotyped way. In order to check the way in which student teachers work with the simulators, the student teachers and the simulators were recorded simultaneously and this videotape was then used later for externally mediated self-confrontation via closed-circuit television and video-recording. A detailed description is given of the simulators and their construction and the results of a pilot study are presented.

46. Bierschenk, B. (1976). Selbstkonfrontation über Closed-Circuit Television in der Lehrerausbildung: Ergebnisse, Implikationen und Empfehlungen (Self-confrontation via closed circuit television in teacher training: Results, implications and recommendations). In W. Zifreund (Ed.), *Training des Lehrerverhaltens und Interaktionsanalyse* (pp. 470-524). Weinheim: Beltz. [German translation of the work originally published in *Didakometry,* No. 37; 0046-0230.]

47. Bierschenk, B. (1976). Teoretiska och psykometriska problem vid en datorbaserad analys av intervjutext (Theoretical and psychometrical problems of a computer-based content analysis of interview texts). *Pedagogisk-psykologiska problem*, 2870346-5004. (PsycLIT AN: 1977-02171-001)

Abstract
This report presents the psycholinguistic model underlying the development of a method for a computer-based content analysis, called ANACONDA. A program-flow diagram for the construction of concepts illustrates basic steps in the Semantic Differential Technique. Some metric properties of the scales applied are discussed. The empirical approach of scaling linguistic elements (adjectives and verbs), which are taken out of context, are described. The results of the scaling procedures are given together with examples of the scaled linguistic elements, showing how these are to be used in the next developmental step.

48. Bierschenk, B. (1976). En datorbaserad innehållsanalys av intervjutext: Numerisk beskrivning och multivariat analys (A computer-based content analysis of interview text: Numerical description and multivariate analysis) *Pedagogisk-psykologiska problem*, No. 307; 0346-5004. (PsycLIT AN: 1977-24559-001). [This work was (1976) presented with a paper on 'A computer-based content analysis of interview texts: Numeric description and multivariate analysis' at the Meeting of the *Swedish Group for Cognitive Psychology*, Stockholm, Sweden.]

Abstract
This report gives a description of the steps in an analysis of the dimensionality in interview texts. By means of cluster analysis techniques the interview materials have been condensed. Based on the results derived from several clusters a discrimination analysis has been carried out. In the final discussion the results are related to (1) the psycholinguistic model and (2) the model of the research process, which have guided this research.

49. Bierschenk, B., & Bierschenk, I. (1976). A system for a computer-based content analysis of interview data. *Studia psychologica et paedagogica*, series altera 32; 0346-592. [This work was presented in a Paper on 'Computer-based content analysis: Development of a system' at the Meeting of the *Society for Multivariate Experimental Psychology*, (1976, Autumn), Noordwijk aan Zee, The Netherlands and in a seminar for doctoral students (1977, Spring) at the Department of Statistics, organised by S. Berg, Lund University, Sweden. The work was also presented in a Seminar, organised (1980, January) by L. Mos at the Centre for Advanced Study in Theoretical Psychology, University of Alberta at Edmonton, Alberta, Canada.]

Abstract
Content analysis based on frequency distributions differs from impressionistic analysis and interpretations of written or spoken text. This type of analysis is objective insofar as it requires an explicit analysis procedure and a formalised analysis. Objectification means that a person transfers certain typical human functions to objects, i.e., tools, and that machines are developed that can carry out functions that were originally subjective. In this respect the development of a Computer-based Content Analysis (CCA) is an attempt to objectify the method of content analysis.

50. Bierschenk, I. (1976). Ett år med en forskargrupp: Notiser om aktiviteter inom projekten SÖK och SIR läsåret 1975-76 (A year of a research group: Notes on activities within the projects SÖK and SIR during the academic year 1975-76). *Särtryck och småtryck,* No. 196. School of Education, Malmö, Sweden.

Abstract
The research projects SÖK and SIR had regular meetings during the academic year 1975-76. The author has summarised the discussions at the meetings with the aid of notes taken. The activities of the projects have been documented, both discussions of research as well as of practical nature. In this report are summarised the main subjects of discussion, the way in which the activities were distributed over the year, and how the activities of the group members have been reflected in the protocols. The report should be seen as a suggestion for more strictly accounts on the different phases of a research process.

51. Frost, G. (1976). Simulering av interpersonella relationer i lärarutbildningen: En vidareutveckling av SIR (Simulation of interpersonal relations in teacher training: A further development of SIR). *Pedagogisk-psykologiska problem,* No. 293; 0346-5004.

Abstract
The report describes the development of an interactive behaviour simulator, anchored in theories of behavioural science. It is based on an interaction between teacher behaviours and video-recorded pupil reactions. After presentation of a number of

investigations concerning simulation in teacher training, a short description is given of the development of a simulator (SIR). This version has been tested on a small number of student teachers. The results of the tests and reactions to the simulator are given.

52. Arte, H. (1977). Tre uppsatser om beteendevetenskaplig forskning, kulturtraditioner och personlighetsteorier (Three essays concerning behavioural research, traditions of culture and theories of personality). *Pedagogisk-psykologiska problem,* No. 313; 0346-5004.

Abstract
1. A model of analysis is introduced and behavioural science is delimited using scales of definitions. Various steering factors in science are discussed. Special attention is directed to the steering power of the scientific language 2. The development of school-system and special education are analysed in relation to two traditions of culture: the scientific-mercantile and the humanistic-romantic traditions. Four different periods in the development of special education are distinguished. 3. Some theories of personality are summed up and commented. A structure analytic model of personality relevant to teacher education is introduced. Examples of use of the model in connection with simulated interpersonal relations (video-recorded pupil-reactions) and structure analytical talks are given.

53. Bierschenk, B. (1977, Lent Term). A psycho-ecological model for the simulation of interpersonal relations: System development and some empirical results form teacher training. *Cambridge Journal of Education*, 7 (1), 71-85; 0305-764X. [This work was presented (1977, Spring) in a paper on 'Results of interactive behaviour simulation' at the Meeting of the *Swedish Group for Cognitive Psychology*, Lund, Sweden.]

Abstract
When a society plans the upbringing and education of its members, irrespective of age and level, one absolute requirement must be that it develops their ability of self-determination. A psycho-ecological approach to a study of the individual's self-cognition (perception and evaluation) and self-determination (i.e. development of plans of action) focuses on the mutual relations existing between the individual and his environment, and the dynamics of these relations. More concretely, the aim is to develop a system of simulators that can be used in, for example teacher training, so that the teacher can become an active, creative member of teaching groups, where everyone is given the chance of creating his own learning environment.

54. Bierschenk, B. (1977). A computer-based content analysis of interview text: Numerical description and multivariate analysis. *Didakometry,* No. 53; 0046-0230. (ED 152 223). [This work has been presented (1977, Spring) in a seminar for doctoral students at the Department of Statistics, organised by S. Berg, Lund University, Sweden.]

Abstract
This report describes the method of approach used in an analysis of the dimensionality of interview texts. By means of cluster analysis models, the interview materials have been agglomerated. On the basis of these results the relation pattern has then been studied by means of a discriminant analysis. In the final discussion the results are

related to (1) the psycholinguistic model and (2) the model of the research process, which have guided this research.

55. Bierschenk, B. (1977). A new approach to psychometric problems in the analysis of pre-numeric data. *Didakometry,* No. 55; 0046-0230. (ED 163 061; PsycLIT AN: 1978-20063-001)

Abstract
This report suggests a new approach to quantification of the relationships within a whole sentence and presents a system for the *anal*ysis of *con*cepts by *da*ta processing (ANACONDA). The psychological model for ANACONDA is outlined and a first measure building up concepts with an empirical root is discussed. Panel assessments have been used for quantification resulting in high reliability scores. By means of cluster analysis the empirical materials concerning researchers' views of scientific information and documentation have been homogenised. On the basis of the results obtained, the relation patterns have been studied by means of a discriminant analysis. Finally, an attempt has been made to demonstrate the validity in the methodological approach used.

56. Bierschenk, B. (1977). Tre utgångspunkter för beteendevetenskaplig teoribildning: En beskrivning av associations-, struktur- och processparadigmen (Three approaches towards theory building in the behavioural sciences: A description of the association, structure- and process paradigms). *Kompendieserien*, No. 20; 0346-5012.

Abstract
Three approaches towards theory building in the behavioural science are described. It is pointed out that model construction requires general theoretical concepts, which are well defined. The presentation aims to clarify what is meant by the (1) association, (2) structure, and (3) process model. The models have been the starting point for the development of a simulator of interactive behaviour (SIR).

57. Bierschenk, B. (1977). Research planning from a micro-ecological perspective: Summary of interview study. *Educational and psychological interactions,* No. 60; 0346-5020. (ED 147 347)

Abstract
This report presents a summary of an interview study. The purpose of the study has been to obtain empirical information on how researchers at institutes of education perceive, structure, and define educational and psychological problems. The collection, evaluation and presentation of the results of the study have been made on the basis of system theoretic assumptions.

58. Bierschenk, B. (1977). Ett system för interaktiv beteendesimulering (A system for interactive behaviour simulation). *Pedagogisk-psykologiska problem*, No. 324; 0346-5004. (PsycLIT AN: 1978-28522-001). [This work as been presented as paper on 'A psycho-ecological model for the simulation of interpersonal relations: System development and some empirical results from teacher training. In A. Perlberg (Chair), *Behaviour simulation.* Symposium conducted at the Meeting of the 19th Congress of the International Association of Applied Psychology (1978) München, Germany.]

Abstract

This report presents a system for the simulation of interactive behaviour strategies. The system has been constructed on the basis of a psycho-ecological model. The core of this system is an action-oriented behaviour simulation. The reliability of the information mediating variables, which have been built into the system, has been calculated. These are the association, structure and process paradigms. Furthermore, some explorative results from an adaptive simulation of behaviour are given together with recommendations for further research and development.

59. Bierschenk, B. (1977). Ein System für die Simulierung von interaktiven Verhaltensstrategien (A system for the simulation of interactive behaviour). *Didakometrie und Soziometrie,* No. 18; 0046-5020. [This work has been presented (1976, Autumn) with a paper on 'regular Markov chains in behaviour simulation' in S. Berg (Chair) Colloquium at the Department of Statistics, Lund University, Sweden.]

Abstract

This article presents in compressed form the development of a psycho-ecological model for simulation of interpersonal relations (SIR). SIR is a method and an instrument, which permits a simulation of strategies of interactive behaviour. From a behavioural science point of view the method should make it possible to map mechanisms that produce and reproduce behaviour. SIR may also be used as an aid in studying how the individual's perception and evaluation steer and control behavioural changes. It is a fundamental aim of this research and development work to create aids that can be used to teach individuals to predict correctly the consequences of the action chosen in answer to something that has happened.

60. Bierschenk, B., & Lienert, G. (1977). Simple methods for clustering profiles and learning curves. *Didakometry,* No. 56; 0046-0230. (PsycLIT AN: 1978-20158-001)

Abstract

This report describes simple methods to test clusters in samples of N profiles or N learning curves For sign patterns from k binary variables with probabilities $\{p = 1/2\}$ of being plus or minus under homogeneity hypothesis (H_0) $r = Z_k$ simultaneous binomial tests are suggested to detect clusters of patterns. Clusters are defined as patterns occurring more often than expected under H_0. The main application is to k continuously distributed variables, which have been dichotomised at their medians to give sign patterns. Clusters in this case correspond to clusters of profiles ($= k$-tuplets of measurements) of similar shape and level. When the k-point curves with $K = Z_k$ as the number of observations per curve are dichotomised at their curve-medians then the curves may be represented by a sign pattern of an equal number of k plus signs and minus signs. Sign patterns more often observed than expected under the zero hypothesis of no learning (horizontal curves) are called clusters of learning curves. The applications of the method are illustrated by examples from (1) similarity judgements in a multidimensional scaling task and (2) avoidance learning in gold fishes. The curve dichotomisation test may be performed as an a priori or more usually, as a posterior test for detecting clusters of similarly shaped curves or profiles.

61. Bierschenk, I. (1977). En studie av modifierande ords kontextuella funktion: En principdiskussion och några kvantifieringsförsök (A study of the contextual function of modifiers: Foundations for quantification). *Pedagogisk-psykologiska problem*, No. 314; 0346-5004.

Abstract

Within a research project on computer-based content analysis empirically specified content of nouns is assumed to come about through weighted verbs and adjectives connected with the nouns. Based on this assumption noun clusters have been established. This study tries to find out a method for measuring the function of adverbs within the adjectival structure. It is namely possible that the weight of the respective adjectives could change in connection with modifiers in such a degree that the content of the nouns must be reconsidered.

62. Bierschenk, I. (1977). Datorbaserad innehållsanalys: Kodningsmanual (Computer-based content analysis: Coding manual). *Pedagogisk dokumentation*, No. 52; 0346-5039. [This work has been presented (1980, October) with a paper on 'Cognitive structures in text' in E. Sandewall (Chair) *Colloquium on data logics,* Dept. of Mathematics and data logics, Institute of Technology, Linköping, Sweden.]

Abstract

This manual is a result of empirical studies of interview materials. It is based on a model for the formalisation of text, which is developed on research within the fields of psychology and linguistics. With this background a psycholinguistic model is outlined on which a computer-based content analysis technique has been worked out. The presentation of the manual follows the stages of the model. The main part consists of the coding rules together with authentic examples and technical advices for punching. Though these rules are constructed on the basis of speech, they are easily applicable to written texts.

63. Robertsson, L. (1977). Datorprogram till ANACONDA - en teknik för textanalys (A computer program to ANACONDA - A technique for the analysis of texts). *Pedagogisk-psykologiska problem,* No. 317; 0346-5004.

Abstract

This report presents a comprehensive description of the computing methods used for testing ANACONDA (*Anal*ysis of *Con*cepts by *Dat*a processing). Of special importance is the program developed for identification of words in the text with words in the dictionary. In the form of an appendix some background information to the ANACONDA method is given.

64. Bierschenk, B. (1978). Ergebnisse aus einem Experiment zur Beeinflussung der Kognition extern vermittelter Lehrer-Schüler-Beziehungen durch Persönlichkeitsvariablen (Results from an experimental study of the effects of personality variables on the cognition of teacher-student relations). *Didakometrie und Soziometrie,* No. 22; 0046-5020.

Abstract

In connection with a self-confrontation experiment (1969/70) student teachers have been tested with personality, cognition and attitude inventories. This report contains a

summary of the most important results concerning the structural interdependencies between personality variables and the perception and evaluation of one's own VCR micro lessons. The perception of the students can most adequately be predicted with the aid of personality variables, which are defining extraversion, social plasticity and child-centeredness. The evaluation is best predicted with personality variables, which are defining emotionality and sensitivity.

65. Bierschenk, B. (1978). Interaktive Verhaltenssimulierung: Modell- und Systementwicklung (Simulating interactive behaviour: A model and a system in development). *Zeitschrift für empirische Pädagogik*, *2* (4), 268-304. (PsycLIT AN: 1980-23244-001). [Original published in *Educational and psychological interactions,* No. 65; 0346-5020.]

66. Bierschenk, B. (1978). Innehållsanalys som forskningsmetod (Content analysis as research method). *Kompendieserien*, No. 25; 0346-5012.

Abstract
Practicable methods for a thorough, reliable and valid analysis of content are fundamental for the behavioural scientist who is working with sets of verbal data. This report presents principles and methodological suggestions of data collections and data analyses. Problems of reliability and validity are discussed in connection with given examples. Methods and techniques for computer-based content analyses are also introduced. Finally some international trends in the methodological development are outlined.

67. Bierschenk, B. (1978). Simulating strategies for interactive behaviour. *Studia psychologica et paedagogica,* series altera 38; 0346-592. [This work has been presented (1980, October) with a paper on 'Interactive behaviour simulation' in E. Sandewall (Chair) *Colloquium on data logics*, Dept. of Mathematics and data logics, Institute of Technology, Linköping, Sweden.]

Abstract
Effective communication is of crucial importance for the development of effective social organisations. Deficient communication combined with rapid technological and social changes appears to lead to both ecological and psychological imbalance. An increasing number of environmental groups are working for ecological improvements, but young people seem to find it increasingly difficult to master the task of developing an integrated personality. This shows itself in stress and an inability to develop flexible behavioural strategies in interaction with other people. For the purpose of testing new models and constructing new instruments for analysis and training of the individual's way of observing, evaluating and integrating information about himself and his surroundings in existing cognitive structures, based on a psycho-ecological model, a simulator for interactive behaviour has been developed. Basically, it is assumed that perceptual experiences are directly related to events and that a person must first become aware (observe) and understand (analyse and synthesise) events before what he has experienced can be integrated into an existing cognitive pattern.

68. Bierschenk, B. (1978). A system for interactive behaviour simulation. *Educational and psychological interactions,* No. 65; 0346-5020. (ED 192 754). [This work was presented as Paper on 'Interactive behaviour simulation: Model and system development' at the 27th Meeting of the *Arbeitsgruppe für Empirische Pädagogische Forschung (AEPF)*, 1978 in Düsseldorf, Germany and in a Seminar, organised (1980, January) by L. Mos at the Centre for Advanced Study in Theoretical Psychology, University of Alberta at Edmonton, Alberta, Canada.]

Abstract

This report presents a system for simulation of interactive behaviour strategies. The system has been constructed on the basis of a psycho-ecological model. The basic unit is an event. Each event has been concretised by means of closed circuit television and video recording techniques and anchored in three basic paradigms of behavioural science, namely the paradigms of association, structure and process. The report shows that the structure of properties that is typical for the paradigms has an empirical foundation and the simulator is an objective and reliable instrument. Some exploratory evaluations of adaptive behaviour simulation suggest that it is mainly the association paradigm that has influenced the development of a behaviour strategy. The report concludes with some suggestions for continued research and development work.

69. Bierschenk, B. (1978). Ein neues Verfahren zur Lösung psychometrischer Probleme in der Analyse verbaler Daten (A new approach to psychometric problems in the analysis of verbal data). *Didakometrie und Soziometrie,* No. 20; 0046-5020. [This work has been presented as a paper on 'Results of computer-based analyses of interview data'. In T. Herrmann (Chair), *Language in situation.* Symposium conducted at the 31st Congress of the German Association of Psychology, 1978 in Mannheim, Germany.]

Abstract

In behavioural science research verbal expressions are analysed with various methods and techniques. However, in order to describe the relations within an entire sentence quantitatively with the aid of multivariate statistical procedures, ANACONDA has been developed. This acronym implies the notion of a method for the *Ana*lysis of *Con*cepts by means of *Da*ta Processing.

70. Bierschenk, B. (1978). Ergebnisse aus einem Experiment zur Beeinflussung der Kognition extern vermittelter Lehrer-Schüler-Beziehungen durch Persönlichkeitsvariablen (Results from an experimental study of the effects of personality variables on the cognition of teacher-student relations). *Didakometrie und Soziometrie,* No. 22; 0046-5020. [This work has been presented as a paper on 'Results from an experimental study of the effects of personality variables on the cognition of teacher-student relations' at the 28th Meeting of the *Arbeitsgruppe für Empirische Pädagogische Forschung (AEPF)*, 1978 in Landau, Germany.]

Abstract

In a self-confrontation experiment (1969/70), student teachers have been put through an extensive test battery containing personality tests, cognitive tests and attitude tests. In this report are presented the main results of an analysis of the influence of personality on the student teachers perception and evaluation during self-confrontation with their own video-recorded micro-lessons.

71. Bierschenk, B. (1978). En longitudinell analys av kunskapsutvecklingen inom utbildningsforskningen (A longitudinal analysis of knowledge development in educational research). *Pedagogisk-psykologiska problem,* No. 355; 0346-5004. [This work has been presented at the Centre for Advanced Study in Theoretical Psychology (1980, January), University of Alberta at Edmonton, Alberta, Canada.]

Abstract
This report is an initial description and analysis of developmental trends in educational research in Sweden since 1937. The analysis is based on an attempt to give a quantitative description of accessible knowledge. The starting point is a strictly random generated sample of researchers in this field. The analysis indicates that the flow of knowledge mainly depends on a very small but highly active group of researchers.

72. Bierschenk, B., & Bierschenk, I. (1978). Vetenskaplig information och dokumentation: Ett lokalt system i utveckling (Scientific information and documentation: A local system in development). *Pedagogisk dokumentation,* No. 56; 0346-5039. (PsycLIT AN: 1979-07472-011)

Abstract
Within many areas and at various levels people are discussing the problem of information and information overflow, at the same time as the need of information is greater than ever before. This report presents the basis for developing a locally anchored I&D-system within a research organisation. Since the basic concept in information processing is "data", the processes or "events" governing the data flow within a research institute are discussed. It is also outlined in what way sets of data in the form of structurised information are fed to the members of the institute, and what mechanisms have been set up by such an administration. Furthermore, the I&D-system is regarded from an ecological point of view. This stress on the interactive functioning of the system makes it possible to discuss the problem of man-machine adaptation within the frame of information psychology.

73. Bierschenk, I. (1978). Försök med automatisk separering av referenser i en flerspråkig databas (Experiments with automatic separation of references in a multi-lingual data base). *Testkonstruktion och testdata*, No. 34. School of Education, Malmö, Sweden.

Abstract
New types of information- and documentation systems are developed in most countries of the world. Several types of information have been available, but in spite of highly advanced techniques, no programs are yet handling multi-lingual information. This report presents a program, which separates titles of research documents automatically. The search program is based on the matching of specific cues in six languages, which coincide with patterns in the titles. It is shown that the English language can best be recognized and identified. Furthermore there is evidence that automatic coding could be a way to avoid errors when references have to be coded manually.

74. Frost, G. (1978). Simulering av interpersonella relationer i lärarutbildningen: Utveckling av ett schema för klassifikation av handlingsförslag vid lösande av lärar-elev-problem (Simulation of interpersonal relations in teacher training: Development of a schedule for classification of proposed measures for solving teacher-pupil problems). *Testkonstruktion och testdata*, No. 35. School of Education, Malmö, Sweden.

Abstract
This paper presents the development of a classification schedule to be used in the behaviour simulator SIR (simulation of interpersonal relations). The schedule is based on measures proposed by student teachers for the solution of teacher-pupil problems in the simulator. Essential components have been extracted from the alternatives as a basis for categorisation. The next step is division into time phases, i.e. the initial, orientation, exploration, adjustment, activity and final phases. In the simulation the respective time phase in the course of action is sought for first. Subsequently a decision is made as to which category is to apply.

75. Wieltschnig, E. (1978). Der Einfluss der Selbstkonfrontation mit Videorekorderaufnahmen auf das Verhalten bei Übergabe von Information: Ein Versuch zur empirischen Analyse des Erklärungsverhaltens und dessen Beziehung zu Persönlichkeitseigenschaften (The influence of self-confrontation with video recordings on the behaviour while passing on information: An investigation to analyse empirically the explanatory behaviour and its relations to personality features). *Didakometrie und Soziometrie,* No. 21; 0346-5020.

Abstract
In this investigation, the influence of self-confrontation on the behaviour while explaining reasoning problems is analysed with the aid of several parameters of verbal behaviour. The behavioural change of persons with the opportunity to come to an understanding of their own behaviour by means of video recordings is compared with the behavioural change of persons without self-confrontation. Moreover, the explanatory behaviour in general and the change of the explanatory behaviour after several explanatory procedures with and without self-confrontation are related to personality features.

76. Bierschenk, B. (1979). Ein neues Verfahren zur Lösung psychometrischer Probleme in der Analyse verbaler Daten (A new approach to psychometric problems in the analysis of verbal data). In L. H. Eckensberger (Ed.), *Bericht über den 31. Kongress der Deutschen Gesellschaft für Psychologie (DGP) in Mannheim* (pp. 80-84). Göttingen: Hogrefe. [Original published in *Didakometrie und Soziometrie,* No. 20; 0046-5020.]

77. Bierschenk, B., & Bierschenk, I. (1979). Analys av en interaktiv informationsorganisering (An analysis of a system for an interactive organisation of information). *Pedagogisk-psykologiska problem,* No. 358; 0346-5004.

Abstract
This report contains the evaluation of an I&D system developed at the Department of Educational and Psychological Research in Malmö. The analysis concerns (1) researcher's specification of research problems for a selective dissemination of information, (2) the efficiencies of an adaptive and self-regulating system, and (3) information behaviour, need and resources within a locally organised I&D-system.

The analyses are based on observation data from one academic year. Together with the results some concrete recommendations for a more permanent organisation of research information at the source are given.

78. Bierschenk, B., Bierschenk, I., & Sternerup, A. (1979). Ett datorprogram för syntaktisk kodning av titlar till vetenskapliga skrifter (A computer program for syntactic coding of titles to scientific documents). *Testkonstruktion och testdata,* Nr. 36. School of Education, Malmö, Sweden.

Abstract
A user-oriented coding of knowledge, which is disseminated through titles to scientific work requires information systems, which build on cognitive models. A computer program with comments to conceptual coding of titles is presented in this report. The cognitive model, which has governed the program development, is described briefly. The functioning of the program is illustrated with some computer outputs from a data base, which is representative of Swedish educational research.

4. Period: 1980-1989

4.1 Introductory Remarks

A basic prerequisite of the development of competence, scientific progress, and preservation of knowledge in an information-rich society like ours is that our representation and dissemination of information is easily accessible. For some time, a new and profound interest in the effect of people's access to or isolation from information has been noticed. Within more and more scientific fields, researchers are giving their attention to questions on how information should be represented and organised in a human context. Among other things, the need for a new view on the cognitive process is being discussed. In this connection, the relations between language and the development of a society knowledge-wise have been in focus during the 80's.

Advances within telecommunications and computer technology have led to changes in the proportions of the information flow and have given knowledge a novel and more abstract character. The technical advances have, moreover, led to an over-confidence in the possibilities of engineering. However, more and more people have experienced some negative consequences of the formalism called for by the new techniques. Seen within the human context, research and progress in computer technology reflect a deficient understanding of the unique nature of knowledge development in humans. To drive the development forward a fresh research approach is needed concerning the basic cognitive prerequisites of information processing within the scope of living and non-living systems.

In these circumstances, the *Cognitive Science Research Group* has been formed in 1984 at Lund University with the aim to create a proper forum for research in cognitive science. The fields concerned are the Humanities, the Social sciences and Business administration as well as ADB, i.e. information processing/data logics. The direction taken by the group were the cognitive in preference to the methodological and instrumental.

Problems of information dissemination and search for scientific information have resulted in a study of the linguistic power in the analysis of generalised descriptions, which had as its task to discover and develop an intermediate language structure with the aim of processing highly abstracted information. Among other things, this research has involved the development of algorithms for coding conceptual information from report titles or chapter headings. Moreover, related computer programs have been worked out as part of a project on scientific information and documentation. Some of these works have been presented as textbooks for the study of psychometric and other metrical problems in the empirical research context.

Since the results of the studies pointed towards the import of knowability, the development of a theory and method for the representation of knowability required that further investigations had to be concentrated on the specificity and uniqueness of the individual. Hence the foundation of the research in the 80's allowed the establishment of the dynamic basis for self-organisation and finally self-reference. Individual text production together with the development of an algorithm for automatic processing did result in "Perspective Text Analysis". Based on the Agent-action-Objective [AaO] axiom, the approach provided the opportunity to extract specificity.

79. Bierschenk, I. (1980). Intermediate language structure. A method for the generation of a language for representing scientific information. (Doctoral dissertation, computational linguistics, Gothenburg University). *Dissertation Abstracts International*, No. 43, 1543C-1544C. [Parts of this work have been presented at the *Working Meeting on Library Science* (Chair: K. Marklund) at the Institute of Technology, (1980, Autumn), Linköping, Sweden.]

Abstract

In modern information and documentation systems, the thesaurus has the important function of serving as a link between the author of a document and the information searcher. For this reason, the language structure of thesauri should receive more attention than has been the case so far. In this study, the intermediate function of the thesaurus has led to an investigation of the principles for structuring and representing information in such a way that it corresponds to the cognitive structure assumed to exist in the information searcher. The model of investigation of cognitive representation is based on overt manifestations of concepts and conceptual relations as they emerge in the abstract language of titles of scientific documents. On the basis of this language structure, an algorithm has been developed for coding the relevant concepts by means of prepositions. The relevance of the concepts is judged with respect to a schema model containing the main components Problem, Method and Goal, assumed to represent the basic components of research itself. When applied to scientific titles, the assumption is verified. The algorithm generates the concepts corresponding to the components, and assigns them to different data registers. An important result of the analysis is thus that the intermediate language structure of scientific titles displays a degree of abstractness suitable for automatic concept extraction, provided that an information- or cognition-oriented approach is employed in order for the data registers to be properly interpreted.

80. Bierschenk, B. (1981, June). Memory and mind. Paper presented at the *Meeting of the First Scandinavian Conference on Cognitive Science*, initiated by B. Bierschenk and organised in cooperation with the Dept of Administrative Information Processing (ADB), Lund University, Vittsjö, Sweden.

Abstract

The presented paper concerns cognitive science research, based on a two by three classification model. The two rows refer to the difference between 'frame' and 'schema', while the column (1) refers to the 'Logic of the Organ', the column (2) delineates the 'Logic of Action' and column (3) opens for a discussion of the 'Logic of Conception' in contrast to the others. Oriented towards the development of a system theory of cognitive processes, the cells encompass the conditions, which contrast to mathematical and meta-mathematical approaches. Hence, the utilities of the computer are put in the context of the research processes, which means that economical and more precise models are confronted with the conditions for empirical research. [Details of the implied research strategy may be found in Bierschenk, B., & Bierschenk, I. (1986). Concept formulation. Part I: The phenomenon of cognition. *Kognitionsvetenskaplig forskning*, No. 10; 0281-9864.]

81. Bierschenk, B. (1981). Conceptions of cognitive functions in a science of knowing. *Didakometry,* No. 63; 0046-0230. [This work includes the paper on 'Cognitive Science and its relation to a science of knowing', prepared for the *Working Meeting on the Social and Psychological Aspects of Videotex* at Le Chateau Montebello, Quebec, organised in (1981, Autumn) by D. Phillips, Department of Communications, Government, Canada.]

Abstract
This article presents a critical discussion of the use of the notion "frame", especially by computer scientists, as a theoretical construct to describe the cognitive representation of information. It is argued that an adequate description of "knowledge" requires the utilization of the notion "schema" as the theoretical construct. Based on this discussion, the construction of abstract cognitive models is proposed. Further, the concept of a memory is considered superfluous because the assumed cognitive structure is conceived as being essentially "shapeless" and not directly accessible through consciousness. The basic assumptions of models too concrete in nature are examined and it is argued that the object orientation and a reduction of "knowing" to some effective procedure governing theoretical discussions within the field of Artificial Intelligence and recently in Cognitive Science is seriously misleading with respect to cognitive functions and the development of knowledge.

82. Bierschenk, B. (1981). An ecological approach to the processing of symbolic information. *Didakometry*, No. 64; 0046-0230. [Presented (1891, September) at the System Development Laboratory, (Chair: J. Bubenko), Department of Computer Science, Chalmers University of Technology and the University of Gothenburg, Sweden.]

Abstract
This article attempts to prove that an adequate cognition oriented approach to the processing of symbolic information abstracted from verbal expressions must consider a running text instead of scattered sentences. It is argued that the dominant cognition models do not give due consideration to the fact that a valid abstraction of information structures has to be based on an explicit encoding of intentionality and valuation. Following a critical discussion of the foundations of the existing models, it is stated that a model is required that can cope with empirical context and novelty instead of truth-values in semantic-logical contexts. The proposed theory has been validated on empirical text materials. It is shown that its underlying key relations can be extracted by means of discriminant functions and given a meaningful interpretation.

83. Bierschenk, I. (1981, April). A computational linguistics approach to conceptual information processing. In N. Fjällbrant (Ed.), *Libraries and the Communication Process*. Proceedings of the 9th Annual Meeting of IATUL Conference, Lausanne, Switzerland.

Abstract
The purpose of this paper is to present a linguistic model which can be used for the processing of scientific information. The model has developed through several years of research and experiments in information mediation, structuring, organisation and dissemination in such social and humanistic sciences that have been of interest to Swedish educational research. It has been apparent that a so-called "information

overflow" and "information explosion" are irrelevant concepts to designate the state of affairs. There exists an ever growing data flow but a considerable lack of information, for example among many professional categories requiring information, such as university teachers and researchers. This so-called "information frustration" is likely to depend on the meaning an individual abstracts or infers from the data, e.g., in the interpretation of concepts and conceptual relations mediated in document titles. In a computerised I&D search strategy, there is a more serious barrier involved. If the logic of the computer or the system is unknown, there is a high risk of uncertainty as to the real existence of the documents, which makes for an abstractness of an even higher order. Moreover, when the information mediator conceptualizes in a way different from the searcher, which is often the case in social science research, it will prove difficult to arrive from data to information.

84. Bierschenk, I. (1981). An information processing experiment: A method for the generation of an intermediate language for representing scientific information. *Didakometry*, No. 62; 0046-0230. [Revised version of doctoral dissertation (1980) at Gothenburg University.]

Abstract
This experiment starts with the assumption that the structure and representation of scientific information should correspond to the cognitive structure assumed to exist in both user and producer of information. The model of investigation of cognitive representation is based on overt manifestations of concepts and conceptual relations as they emerge in the abstract language of titles of scientific documents. On the basis of this language structure an algorithm has been developed and tested using the cue function of prepositions for automatic conceptual coding. The relevance of the concepts is judged with respect to a schema model containing some basic components of research itself. The algorithm generates the assumed scientific concepts and assigns them to different data registers.

85. Bierschenk, B. (1982). An ecological model for the processing of symbolic information. *Perceptual and Motor Skills*, *54*, 663-674; 0031-5125. (PsycLIT AN: 1982-29558-001). [Original published in 1981 in *Didakometry*, No. 64; 0046-0230.]

86. Bierschenk, B. (1984). Steering mechanisms for knowability. *Kognitionsvetenskaplig forskning*, No. 1; 0281-9864. [This work has been presented in 1985 at the *Meeting of the European Society for the Study of Cognitive Systems*, organised by G. Dalenoort, in Offenburg, Germany.] (ED 264 246)

Abstract
The foundations of knowledge by tradition have been treated analytically and knowledge has been characterized as a theoretical subject. This article introduces a steering mechanism as the prerequisite for a study of knowledge work and mainte-nance on empirical grounds. Knowledge is treated synthetically, that is, as something that exists only through the individual's cooperation with its environment, which implies that criteria can be formulated for the isolation of knowledge processes. Specific processes may then be studied and interpreted with reference to manipulable factors and to the influence of these factors on measuring processes and theory construction.

87. Bierschenk, B. (1984). The split between meaning and being. *Kognitionsvetenskaplig forskning*, No. 3; 0281-9864.

Abstract
The discussion in this article takes its point of departure in the generally accepted position of cognition-oriented scientists that intelligent behaviour requires an organism/formalism, which can abstract information from the environment. By examining some operationalised schema models the author shows to what extent these have been capable of explaining the development of behaviourally meaningful cognitive functions. The discussion of the models is oriented towards techniques for specifying the position of the autonomous observer and on experiments that amplify the relationship between invariants and transformation. The presentation shows that efficient transaction with the environment rests on theoretical formulations that assume the cooperative interaction of a conscious organism with its environment. It is argued that primitive operations such as conditional judgment and classification are elementary and essentially unlearned activities. By condition oriented schema models leading to outcomes based on these operations, cognition oriented towards novel solutions cannot be obtained.

88. Bierschenk, B., & Bierschenk, I. (1984). Verhalten auf dem "Visual Cliff": Repräsentation von experimentellen Beobachtungen in natürlicher Sprache (Behaviour on the Visual Cliff: Representation of experimental observations in natural language). In B. Wolf (Chair), *Psychological ecology.* Symposium conducted at the 34th Congress of the German Association of Psychology (DGP) in Wien, Austria. [This contribution has become part of the article 'The schema axiom as foundation of a theory for measurement and representation of consciousness' in *Kognitionsvetenskaplig forskning*, No. 38; 0281-9864.]

Abstract
This paper was prepared for a discussion of the concept of the schema, which is the fundamental pre-requisite for the representation of experimental observations in natural language. On the basis of the schematism in language, the agent (knower) has been identified as the integrative component, which gives it the steering function in the behaviour on the visual cliff and the schematising processes as expressed in language. By founding a symbolic expression on the schema model, we have been able to demonstrate that the general co-operation of the organism with the environment presupposes the teleonomic concept in order for the knower to express an intended and oriented schematisation. [A refined analysis and discussion has been presented (1987, August) at the University of Trieste.]

89. Bierschenk, B., & Bierschenk, I. (1984). The perspective in the verbal flow. *Kognitionsvetenskaplig forskning*, No. 4; 0281-9864. (ED 266 627). [The work of this article has been presented in a Colloquium (Chair: L. Larsson) on 'Research methods; measuring of mental structures' (1984, November), Department of Landscape Planning, Alnarp, Sweden.]

Abstract
The concept of agent is introduced into a psychological analysis of natural language. The agent component has a steering function in the development of a perspective throughout a text. This is shown by an experiment with the series of pictures from the

Visual Cliff studies. The pictures have been used to examine individual differences in the perception of ecologically significant information. Through a numerical analysis perceptual syndromes have been demonstrated.

90. Bierschenk, B., & Bierschenk, I. (1984). Structural variations in verbally reported objectives. *Kognitionsvetenskaplig forskning*, No. 6; 0281-9864. [This work has been presented in a paper on 'Multivariat analys av texter (Multivariate analysis of texts)' at the Research Institute (Chair: E. Möller) of the National Bureau of Statistics (1984, April) in Stockholm, Sweden.]

Abstract
The study reported shows the implications of incorporating the autonomous observer into the experimental range. Subjects have verbally described pictorially mediated information, and their determination of the action centre of the observations has been made the basis for clustering ecologically significant objectives. It is demonstrated that objectives, conceptually divided into the subcomponents Figures and Grounds, are structured differently both in relation to each other and in relation to the sources of observation. By using linguistic cues to the binding between perspective and objective structure, the authors have been able to come to a meaningful interpretation without assumptions of causality.

91. Bierschenk, B., & Bierschenk, I. (1984). Reasons for co-operative structure. *Kognitionsvetenskaplig forskning*, No. 7; 0281-9864.

Abstract
Both ecological and conceptual environments require a ground for their observation. The ground structures an observer's perception of objects and events. It is therefore of high experimental importance that subjects are given the opportunity to verbalise freely how they perceive an environment and orient themselves in it, since in their language there will be expressed towards what kind of ground structure they operate in the perception process. The experiment described in this article has been based on the linguistic definition of the Ground component. It has been shown that subjects' cooperative structuring of an environment differs on the basis of expressed grounds and that this difference can be interpreted with reference to personal interests.

92. Bierschenk, I. (1984). The schematism of natural language. *Kognitionsvetenskaplig forskning*, No. 2; 0281-9864.

Abstract
The discussion in this article starts with an object-based description of natural language. By examining the relations imposed on language and contrasting them with the relations in a subject-based model, the author shows the importance of incorporating subjectivity into language formalism. The alternative presented is based on the identification of the agent function and presupposes that discrimination between perspective and objective be formalised. The way in which detection of the scope of observation determines the subjective meaning of a sentence is demonstrated.

93. Bierschenk, I. (1984). The schematism of natural language. In O. Togeby (Ed.), *Papers from the 8th Scandinavian Conference of Linguistics,* Copenhagen, Denmark, 1985, pp. 73-78; 87-88847-00-4. [This work was originally published in1984 in *Kognitionsvetenskaplig forskning*, No. 2; 0281-9864.]

Abstract
Language processing can hardly be discussed without a statement of the fundamentals on which the instrumentation rests. The models and their operationalisation express the linguist's starting-points, more or less conscious, when he faces the phenomenon of language. A commonly accepted position in linguistics is that language is a set of culturally transmitted conventions. The language describing these conventions is called a linguistic model when it forms some systematics. To linguists this instrument contains implicit and thus self-evident relationships between language and its description. In the study of human functions related to intelligent behaviour, these relationships have to be made explicit, since there is no way of circumventing language in dealing with cognitive phenomena. Consequently, in the search for a cognitive mechanism, language has an instrumental function.

94. Bierschenk, I. (1984). Intended predication. *Kognitionsvetenskaplig forskning*, No. 5; 0281-9864.

Abstract
The basic argument of this article is that the predicate, in its profane sense, has a realistic ground. A discussion of realism in language analysis is made on the basis of a reconstruction of the paradigmatic functions intended in the Objective component. By introducing the Subject component as the governing factor for analysing predications, the author schematically demonstrates the "ecologically significant" double binding between the objects of the predicate.

95. Bierschenk, B., & Bierschenk, I. (1985). The agent function as the basis for perspective control. *Kognitionsvetenskaplig forskning*, No. 9; 0281-9864. (ED 267 374)

Abstract
How to study knowledge representation on empirical grounds has been made the theme of this article. It emphasises in particular the steering and controlling function of the agent. The agents of a text are bound to a perspective. By differentiating the perspective from the figure and its ground the method presented shows how these basic components covariate. Their coordinative structure is brought out by means of a topographic representation.

96. Bierschenk, I. (1985, June). The agent function as the basis for perspective control. Paper presented at *The Meeting of the European Society of the Study of Cognitive Systems*, organised by G. Dalenoort, at Offenburg, Germany. [Original published in 1985 in *Kognitionsvetenskaplig forskning*, No. 9; 0281-9864.]

97. Helmersson, H. (1985). Schemabiten i diagnosen av kunskapsstrukturer. *Kognitionsvetenskaplig forskning*, No. 8; 0281-9864.

Abstract

This article presents an attempt to construct a knowledge model on the basis of' the use of a computer-based planning model. The precision and analysis of different knowledge generation processes are made with reference to the school environment. The basic unit of analysis is a "timetable unit" defined within the timetable as a number of combinations of subject-teacher-class-room. The timetable unit is conceptualised as a unity, while the relations between the components are used for a diagnosis of cognitive structuring. The result of the structuring process has been ana-lysed by means of an empirical investigation of attitudes in which persons working practically with school timetabling got the opportunity to use the planning model. The cooperation between their experience of planning and use of the model is made the starting-point for a figurative presentation of three distinct competences.

98. Bierschenk, B. (1986). The cult of understanding. *Kognitionsvetenskaplig forskning*, No. 15; 0281-9864. (ED 295 944)

Abstract

In this article, understanding is discussed with reference to an Agent-action-Objective model. The formalism developed controls the processes of differentiation and integration underlying understanding. The starting point is a culturally agreed-on expectancy or prescription, which defines a particular form of understanding. Central to an investigation of how scientists model understanding is how they conceive symbols. The collective cognitive imperative in the scientific community states that symbols are abstract codes, whose definitions are wholly arbitrary and because of this can only be understood by those who have the same common outlook. Scientists working with the development of computer technology, especially within the field of artificial intelligence, have repeatedly pointed out that they have constructed models of understanding natural language of significance for cognition-oriented research. Therefore, some by now classical models have been made the foundation of this discussion. Finally, the discussion points at the importance of self-reference as constituent component in any model or theory of understanding.

99. Bierschenk, B., & Bierschenk, I. (1986). Analyse der Sprache in Verhaltenssimulierung (Analysis of language in behaviour simulation). In W. Langthaler, & H. Schneider, (Eds.), *Video-Rückmeldung und Verhaltenstraining* (pp. 63-102); 0721-6998.

Abstract

A simulation model is presented, which has been constructed in such a way that the trainee gets control over the context of her actions. Three types of simulated action-event-sequences are presented in an inductive way The aim is to demonstrate the texture of the simulation process. It is shown that visualised as well as verbalised information has to be processed in a cooperative manner in order to abstract the ecological invariants in the flow of the simulation process. Three analyses are report-ed, which show the extent to which the trainee becomes conscious of the structural strands lying in the texture of the illustrated simulation process. That higher-order components are to be found in the texture of the context is reflected in the course of actions taken.

100. Bierschenk, B., & Bierschenk, I. (1986). Concept formulation: Part I. The phenomenon of cognition. *Kognitionsvetenskaplig forskning*, No. 10; 0281-9864. (ED 275 159)

Abstract
A common way of looking at cognition builds on the generation and representation of knowledge based on syntactic models. Above all, in connection with computer applications, it is proposed that the syntactic models are of significance for research on language and cognition. In the representation of a cognitive phenomenon, language plays the central role. Therefore, a contrasting discussion of the basic assumptions of both syntactic and paradigmatic models is the starting point of a method development that differs markedly from the common view of cognitive functions. This is the first of three articles about the way in which people formulate their observations.

101. Bierschenk, B., & Bierschenk, I. (1986). Concept formulation: Part II. Measurement of formulation processes. *Kognitionsvetenskaplig forskning*, No. 11; 0281-9864. (ED 275 160)

Abstract
This article is the second one of three presenting a framework, a method, and results respectively of a study of the ways in which people formulate their observations. The starting-point of this part is a discussion of the assumptions underlying analytical and class-based models. It is shown that the analytical approach to a measurement of cognition is inappropriate. The typically human ability to cooperative actions requires an instrument accounting for synthesis that is the schematising process, which incorporates both intention and orientation. A rule system based on the synthetic assumptions is given at the end of the article.

102. Bierschenk, B., & Bierschenk, I. (1986). Concept formulation: Part III. Analysis of mentality. *Kognitionsvetenskaplig forskning*, No. 12; 0281-9864. (ED 275 161)

Abstract
This is the third article of a series of three about concept formulation. It presents an analysis of the mentality of a free and unrestricted interview. The article starts with an illustration of the way in which an algorithmic analysis of natural language production has been carried out. Especially the functioning of the algorithm in differentiating objectives from the perspective is emphasised. By means of the agent function, meaningful conceptual relations can be unambiguously and automatically extracted. It is demonstrated that the extracted relations can be structurally represented by means of topographically described dimensions. Textual transformations are made visible in the form of a cubic space within which the developing cognitive process can be discerned. The configuration characterising the process by nine distinct phases is finally discussed with respect to its parabolic dimensions.

103. Bierschenk, B., & Bierschenk, I. (1986). Information needs and instruction policy: An explorative study in cognitive economics. [Paper presented at the Meeting of the *10th Scandinavian Conference on Business Administration*, Bergen, Norway.]

104. Bierschenk, B., & Bierschenk, I. (1986). A cognitive economics approach to information management. *Kognitionsvetenskaplig forskning*, No. 13; 0281-9864. [Parts of this work have been presented at the Meeting of the *10th Scandinavian Conference on Business Administration*, Bergen, Norway.] (ED 276 451)

Abstract

This article presents a study in cognitive economics. It originates from a survey of mechanics carried out by a Swedish multinational machine industry. The verbal response of seven US and seven Swedish mechanics to three open questions concerning information needs were analysed with Perspective Text Analysis. Only configurations building on significant groupings, which do not fall below the lower limit of $t_{.90}$ of the t-distribution, are retained in the analysis. The structures embedded in the texts are visualised in three-dimensional cubic spaces. The results are discussed with respect to their dimensionality as well as to the phase spaces of the cognitive processes. They show that US and Swedish workers diverge considerably in their conception of information needs related to their work, which should have consequences for the information management of the industry.

105. Ottesen, C. (1986). Menneskets moralske straeben som grundlag for en arbejdsmotivationsmodel (Human moral concern as foundation of a work motivation model). *Kognitionsvetenskaplig forskning*, No. 14; 0281-9864.

Abstract

The subject of this presentation is work motivation. The starting point is taken in a critique of the theory of motivation as it has been developed since the beginning of the 19th century and a certain kind of making the human factor to a constant in the production of services. The try-outs, which have been undertaken against this background can be characterised as more or less successful; with the experimentation it has not been possible to achieve with any of the aims. Pinder, therefore, comes to the conclusion, after re-assessing of the motivation theories developed thus far: "… even the more successful theories of work motivation … will provide limited validity and practical value for managers until more is learned about the 'press' of characteristics of organisational settings …" (Pinder, 1984, p. 181). This presentation has been worked out with the purpose to formulate a motivation theory, how an explanation of the motivational states comes into existence, which includes the influence of the organisational reality on these states. The hypothesis is that an understanding of these states requires that one conceives work as a moral action, because the employee will react to this influence, since he will sense it as an obligation to work in agreement with his evaluation of the legitimacy of pressure, with legitimacy, founded in his comprehension of the ethics of work.

106. Bierschenk, B. (1987, May). *A cognitive economics approach to information management*. Paper presented at the Meeting of the Workshop on Human information processing research in accounting conducted at the Advanced Centre for Business Administration and Management, Brussels, Belgium. [Original work published 1986 in *Kognitionsvetenskaplig forskning*, No. 13; 0281-9864.]

107. Bierschenk, B. (1987). Perception of quality of life. *Kognitionsvetenskaplig forskning*, No. 16; 0281-9864. [Part of this work have been presented (1986, October) in a paper on 'Värdighet som beteendekomponent (Dignity as behavioural component') at the Institute for Business Administration and Leadership, Copenhagen Business School, Fredriksberg, Denmark.]

Abstract

Development into a high technology society implies both the enjoyment of tangible benefits and the discomfort of rising costs as regards the ecological pollution and the degradation of the quality of life. This brings forth the need for an assessment of the consequences for every-day life. This article focuses on the need for an assessment of one's own possibility to live in various feasible environmental settings. These have been projected by means of a Behaviour model, a Humanist model, and a Growth model. The Swedish model was also included as a possible point of reference. Subjects were 214 in-service teachers and 57 high school pupils. The result shows that the quality of life as defined by the Growth model is strongly preferred by both groups.

108. Bierschenk, B., & Bierschenk, I. (1987). Consciousness as a function of knowledge and culture. *Kognitionsvetenskaplig forskning*, No. 18; 0281-9864. (ED 290 634)

Abstract

The study of consciousness requires a language for exact and precise communication. This article presents a study of how workers in various cultural contexts value information of relevance to their job performance. The strategy of analysis applied differs radically from the classical approaches. Based on the concept of coordinative structure, functional linkages among textual Agents and Objectives provide for the emergence of mental phenomena. The experimental subjects were 35 randomly selected mechanics from Sweden, England, West Germany, Italy, and United States. Their verbal responses to three open questions were analysed. Only significant groupings that do not fall below the lower limit of $t_{.90}$ of the t-distributions are retained in the analysis. The subjective consciousness embedded in the texts is visualised in a three-dimensional cubic space. The results are discussed with respect to the cognitive process depicted in the phase space. The experimental variable has given rise to different mental structures. A comparison of what seems to be prototypical of these cultural contexts shows a spectrum from economic matters to basic questions of morality.

109. Bierschenk, B. (1987). The ecological approach to diagnosis of service information behaviour. In H. Montgomery (Chair), *Decision-making*. Symposium conducted at the 12th Annual Colloquium of IAREP, the International Association for Research in Economic Psychology (pp 435-452), Ebeltoft, Denmark. [Original work published 1987 in *Kognitionsvetenskaplig forskning*, No. 18; 0281-9864.]

Abstract

This paper presents a new approach to analysing verbal behaviour. Underlying this approach is a subject-governed model, which means that a text producer (agent) is the reference point in coding. The study through which the method is exemplified originates from a survey of mechanics carried out by a Swedish multinational machine

industry. The results illustrate how workers in various cultural contexts value information of relevance to their job performance. Despite their common language, English and US mechanics diverge in the subjective consciousness.

110. Bierschenk, B., & Bierschenk, I. (1987). The knower in the known: A theory of information synthesis. In P. van Geert, & A. Smitsman (Chair), *Cognition*. Symposium conducted at the 4th International Conference on Event Perception and Action, Trieste, Italy. [This paper has been based on the work originally published 1984 in *Kognitionsvetenskaplig forskning*, No. 1; 0281-9864.]

Abstract
An ecologically oriented theory of information synthesis is presented in this paper. A model for the analysis of intentionality and orientation as expressed in natural language is put forward. The thesis is that knowledge is the result of an active inquiring agent (knower). His cognition rests on the extraction and abstraction of invariants. It is a mark of mentality that the knower always conceives the meaning of object-event relationships. Some of the assumptions for this approach are to be found in James J. Gibson's ecological theory of perception. For example, to perceive and conceive the environment is only different in degree but not in kind. As a consequence, the two key concepts perspective and viewpoint play a central role. The model developed rests on the ability to determine the agent function (perspective), which governs language production. Perspective control lies in the definition of the transposition of the agent. Thus the agent function determines what viewpoints are chosen and how they change throughout a text. A second assumption based on Gibson's work is that the meaning of objects is directly perceived and observed before the substance, surface, colour, or form, which implies that a pictorial and symbolic expression links perspective and viewpoints. On the basis of a series of pictures of the original visual cliff experiments it is discussed in what way verbal descriptions and textual transformations mediate the integration of experience as invariant structures.

111. Bierschenk, B., & Mattsson, J. (1987). Axiological measurement of human value factors in mental processes. *Kognitionsvetenskaplig forskning*, No. 22; 0281-9864. (ED 295 943)

Abstract
Modern behavioural research focuses on the possibility of a direct measurement of value preferences. These are conceived as important casual variables of behaviour. The article presents a method and a procedure for the measurement and representation of human value factors. By means of Perspective Text Analysis mental processes of workers from Sweden, England, West Germany, Italy and the United States were captured and topographically represented elsewhere. In this study, the mental processes are measured in accordance with an axiological approach. The outcome of the valuation is represented in sequential flowcharts. The experimental subjects were 35 randomly selected mechanics. The results show great variations in the pattern of displayed valuations. Each pattern is characterized by a distinctive value factor.

112. Bierschenk, B., Helmersson, H., & Lohmander, B. (1987). Worthiness as behaviour component. *Kognitionsvetenskaplig forskning*, No. 17; 0281-9864.

Abstract

Traditionally, respecting people's choice is considered equal with respecting people. Founded on the premise of choice, elaborated and hierarchically organized organisations have been built up to guarantee growth of living standard for securing quality of life. This article reports on a study, which questions the adequacy of this premise. Three models of feasible societies have been used to study the way in which people prefer one or the other with respect to how uncertain or certain they are that their worthiness would be preserved. Subjects were 180 students of economy and business administration. The Swedish model, which in a previous study has proved to preserve quality of life the least, shows the highest assessment on worthiness in this study.

113. Bierschenk, I. (1987). The controlling function of the agent in the analysis of question-response relationships. *Kognitionsvetenskaplig forskning*, No. 19; 0281-9864. (ED 295 945)

Abstract

In contrast to traditional linguistic analysis, a model based on the empirical Agent is put forward and tested. A text is regarded as an intentionally produced cognitive process. The analysis has to take the Agent (perspective) into account in order for an adequate processing of its Objectives (viewpoints) to come about. Moreover, the model is surface-oriented and assumes the cognitive relevance of an utterance to be defined by the dynamics of the text production and not by artificial semantic criteria. The model has been tested on responses to questionnaire items constructed by a multinational industry. The responses were produced by 35 randomly selected subjects from England, Italy, Sweden, West Germany, and the United States. The differences were tested for power of normal curve test of $P_1 = P_2$ via arcsine transformation at $\alpha_1 = .05$. By Agent control of the question-response relationship, differences in coherence could be demonstrated. English and Swedish workers showed a significantly higher coherence with the perspective of the industry, whereas Italian, German, and US workers take up their own Agent function in their response behaviour.

114. Caramelli, N. (1987). The schema concept: Bartlett till now. *Kognitionsvetenskaplig forskning*, No. 21; 0281-9864. [This work was presented (1987, August) as a paper in the symposium *'From Gegenstände höherer Ordnung to higher order invariants'* at the 4th International Conference on Event Perception and Action, Trieste, Italy.]

Abstract

When in 1932 Bartlett first used the concept of "schema" borrowing it from Head, he intended to suggest a unitary structure whose elements interacted in a complex way. This structure, which aimed to insure the continuity of the cognising organism, was at the same time the expression of the functional principle responsible for the mutual interdependence between an organism, the human being, and its environment. Current research on cognitive processes very often refers to the very concept of "schema", but interprets it as a formal structure, which can be defined by its content and reduced to its several elements. The purpose of this paper is to show that the "schema" concept, as held by Bartlett, underwent a radical change as a result of Oldfield's transposition of the original definition into the human information processing conceptual frame. We find in Neisser (1976) and Schmidt (1982) another interpretation of the concept of

"schema". In this context it acquires a rule-like character as well as an anticipatory function. In their work the meaning expressed by the "schema" concept better agrees with Bartlett's. However, it is only within the ecologically oriented interpretation of the cognitive processes that we can find a true reappraisal of the meaning of the "schema" as originally put forward by Bartlett. Jenkins (1980), Bransford (1977), and other psychologists who accepted the assumptions of the ecological approach, are trying to develop their own interpretation of the cognitive activity in which a major role is played by the "schema" as a functional principle according to which the organism as a whole can act completely attuned to its environment. It is precisely in the ecological approach to the study of cognition, in which the word "schema" is rarely used but its original meaning is always present, that we find alive the theoretical flavour of Bartlett's research.

115. Habel, C. (1987). Remarks on the status of inference in the area of knowledge representation. *Kognitionsvetenskaplig forskning*, No. 20; 0281-9864.

Abstract
The concept of inference is one of the global concepts used for the explanation of cognitive processes. There exist mainly two types of characterisation: the logical and the psychological. These different characterisations are based on the difference between inference and rule of inference. Information processing systems can be formalised as inferential systems, i.e. systems with inferential processes. The fundamental concepts of this formalisation, those of dynamical inferential systems and time-restricted derivations, both based on inferential processes are described in detail.

116. Bierschenk, B. (1988). A theoretical basis for estimating quality of life. *European Journal of Political Economy*, *4* (3), 323-332. [@ Transfer Verlag, Regensburg, FRG.]

Abstract
The purpose of constructing measures of the concepts (1) *quality of life* and (2) *dignity* was to assess the possibility of self-actualisation and the constraints on life within each of three simulated social organisations. The potential predictors of the first experiment were derived by a factor analytic study of 51 statements based on N = 271 subjects. The extracted scales are (1) *adaptability-security,* (2) *freedom of action,* and (3) *physical existence.* The predictors of the second study were derived from a factor analytic evaluation of 49 statements based on N = 180 subjects. Two predictors were clearly discernable, (1) *self-actualisation* and (2) *rank.* The location of the models in a multidimensional measuring space requires discriminant analysis. The design of the first study, because of its complexity, was evaluated by means of a factorial discriminant analysis. The first hypothesis to be studied with a multivariate generalisation of the analysis of variance is whether group differences exist with respect to the localisation of the groups in the multidimensional measuring space specified by the three factorised scales.

117. Bierschenk, I. (1988). Språket som bärare av medvetande (Language as carrier of consciousness). *Kognitionsvetenskaplig forskning*, No. 24; 0281-9864. [A draft of this article was presented as 'Culture and mentality in language' at the symposium on *Enterprising spirit – culture or mentality,* organised (1988, March) by the Foundation for Information on Economic Research (EFL) in cooperation with the Cognitive Science Research Group, Lund University, Lund, Sweden.]

Abstract

The purpose of the discussion in this introductory chapter is to give an evolutionary background to a method developed for the analysis of language seen as expression of intention and morality. The method is named "Perspective Text Analysis. This name indicates that beyond the physical dimension of a text there is a metaphysical one, which can be discovered by a formal mechanism. The fundamental component of this mechanism is the Agent, which controls the perspective of the text. It has developed as a consequence of the evolutionary shift from object (culture) as governor to mentality as governor of human action. It is argued that controlling the Agent in a text analysis is the only possible way of controlling consciousness. The main point put forward is that consciousness is bound to syntax. It follows that lexically carried linguistic information cannot be used for intentionally based text analyses.

118. Bierschenk, B., Bierschenk, I., & Helmersson, H. (1988, June). *Perspektivisk Textanalys: Teori, metod och algoritmisk textbehandling (Perspective Text Analysis: Theory, method, and algorithmic text processing)*. Workshop on Perspective Text Analysis at the Department of Business Administration, Umeå School of Business and Economics, Umeå University, Umeå, Sweden. [This workshop has further been offered in the Course on Scientific methods, organised (1987/88) by I. Persson, Department of Industrial Organisation, Institute of Technology at Lund, Sweden.]

Abstract

To whom it may concern: The Department of Business Administration at the University of Umeå had arranged for an intensive course concerning Perspective Text Analysis. Senior researchers and doctoral students attended this course. The aim with the course has been to make the participants familiar with a newly developed computer-based method and to teach them its application in the analysis and synthesis of interview material. Fil Dr Inger Bierschenk, together with Professor Bernhard Bierschenk, and Fil Dr Helge Helmersson, has been teacher and supervisor on the course. The course has aroused great interest and has been greatly appreciated by the participants. It has also given concrete results in the form of a research project at the Department of Business Administration. Pol mag Åke Gabrielsson and Ekon lic Margareta Paulsson are applying the method in an ongoing study of actors' ideas and strategies for local business development. The preliminary results have lately been presented at a Nordic conference on the development of small business in Bodö, Norway. Inger Bierschenk has continually followed and supervised this research. /Rolf Lundin, Professor/

119. Dahlgren, C. (1988). En diskurs om den perspektiviska textanalysen (A discourse on the Perspective Text Analysis). *Kognitionsvetenskaplig forskning*, No. 23; 0281-9864.

Abstract

This article is a presentation of a new method for analysing texts: Perspective Text Analysis. The text is used to illustrate this method and also the results of it I have produced myself. The advantages of the Perspective Text Analysis are discussed in comparison with more traditional methods for content analysis. One of these advantages is the ability of the presented method to specify the objects connected to each agent through an action in text. Through cluster analysis this method can show us how different agent-action-object components in the text are connected to each other.

In this way the "structure" of the text will be revealed. Another advantage is the ability of this method to take account of the perspective the agents have on the objects they are talking about. In the article some comments are also made about the relevance of Perspective Text Analysis for the study of "invisible religion".

120. Bierschenk, B. (1989). The visual cliff transformed: A factor-analytic definition. *Kognitionsvetenskaplig forskning*, No. 25; 0281-9864. (ED 340 712)

Abstract
The problem investigated in this study was formulated against the background of the theory of affordances as it was tested with the famous "Visual Cliff" experiment. The present study is based on the assumption that the perceiver can detect transformational as well as structural invariants not only in the context of the classical "Visual Cliff" experiments but also when their basic assumptions are transformed into the social realm. On the hypothesis that structural invariants can be defined as an invariant combination of variables of significance for the perception of social structure, a series of factor-analytic studies have been carried out with a sample of 700 subjects. Despite different sets of variables, different sample subject, and a time interval of seven years, it was possible to conclude the existence of two ecological components defining the transformed "Visual Cliff". The first one specifies the nature of change, i.e., development of worth. The second one specifies the structure that undergoes change, i.e., visibility of developed worth.

121. Bierschenk, B. (1989). The spirit of human enterprise: A multivariate approach to a study of projected social organisations. *Kognitionsvetenskaplig forskning*, No. 26; 0281-9864. [This work has been presented in B. Bierschenk (Chair), *Ecological psychology: Human response to environmental change*. Symposium conducted at the Meeting of the First European Congress of Psychology (1989, July), Amsterdam, The Netherlands.

Abstract
The goal of the study presented in this paper is based on the idea that James Gibson proposed a radical and productive ecological approach not only to the study of perception but also to conception. The present experiment is an attempt to generalise Gibson's approach to understanding peoples' perception and conception of their social and cultural environment. The experiment has been designed within a multivariate experimental frame and was carried out with 160 lower division university students. The perceptual ability of the experimental subjects were studied with respect to two orthogonally behaving dimensions, one specifying the nature of change, namely development of worth, the other specifying the identity of structure that undergoes change, namely visibility of social structure. Both are highly reliable dimensions (alpha $_{max}$ = .97, .87). The hypothesis of the existence of a "conceptual cliff" was tested by means of a discriminant analysis. The treatment effect is associated with 77% of the explainable variance, which is an effect very rare in the behavioural sciences.

122. Bierschenk, B. (1989). The spirit of human enterprise: A multivariate approach to the study of social organisations. In B. Bierschenk (Chair), *Ecological psychology*: *Human response to environmental change*. Symposium conducted at the Meeting of the First European Congress of Psychology, Amsterdam, The Netherlands.

[This paper has been based on the work published in 1989 in *Kognitionsvetenskaplig forskning*, No. 26; 0281-9864.]

Abstract
The present study is part of a research program whose goal is a unified theory of planning and the achievement of perspective control over one's environment and existence in that environment. A theory that can guide the individual's development toward citizenship has been lacking. Such a theory should be able to explain in what way people comprehend and overview their survival conditions. Overview and perspectivation implies a departure from specialised models that have been designed to account for data coming from different problem solving tasks and different environments. The present experiment instead stresses the contribution that apparent disparate systems can make to the co-operation of the individual's experience with various physical and social surroundings and the cognitive integration a person can achieve. Therefore, the experiment takes its departure in James J. Gibson's theory of ecological perception. Its aim is to extend this approach in order to encompass conception. If this extension is successful, it can be stated that the Visual Cliff concepts of "shallow" and "deep" have been successfully projected into the instructional material used in the present study. The material consists of three video-projected societies, whose in-built perceptual invariants relate to behavioural modification, cybernetics, and evolution. 160 university students judged their living in the projected environments with the Swedish society forming the anchorage. Two distinct factorial dimensions could be discerned. Speaking in Gibsonian terms, one is specifying the structural and the other is specifying the transformational component. The first relates to "shallowness", the second to "depth". Societies built on the principles of behaviour modification and cybernetics are conceived of as promoting high visibility, while the evolutionary principle characteristic of the ecological environment promotes depth, that is, human quality. Finally, to promote human enterprise, an environment, including the school system, which is organised to make visible individual worth, is preferred.

123. Bierschenk, I. (1989). The conscious agent in text production. In B. Bierschenk (Chair), *Ecological psychology*: *Human response to environmental change*. Symposium conducted at the Meeting of the First European Congress of Psychology, Amsterdam, The Netherlands. [The presented paper has become part of *Kognitionsvetenskaplig forskning*, No. 30; 0281-9864.]

124. Bierschenk, I. (1989). Language as carrier of consciousness. *Kognitionsvetenskaplig forskning*, No. 30; 0281-9864. [The original article was published in 1989 in *Kognitionsvetenskaplig forskning*, No. 19; 0281-9864.] (ED 312 645)

125. Caramelli, N. (1989). A statement on metaphoric sentences. *Kognitionsvetenskaplig forskning*, No. 29; 0281-9864. (ED 312 646)

Abstract
This paper aims at pointing out the differing interpretations of metaphoric sentences' comprehension as developed in the recent psycholinguistic literature. The inadequacies of the psycholinguistic theories of language processing which rests on the assumption according to which language is the expression of a relatively autonomous cognitive activity are highlighted in the interpretation of metaphors as

anomalous sentences. The rejection of the thesis of the anomalous character of metaphors due to the acknowledgement of the role of the semantic component of the words, of the extra-linguistic context in which metaphors are produced, and more generally of the pragmatic factors influencing comprehension, invited the new view according to which metaphors are to be conceived as conveying some cognitive re-organisation. The ecological approach to cognitive activity stressing the role played by the 'event' in modelling comprehension can be regarded as the best theoretical frame according to which it is possible to establish a link between language and perception and redefine the whole problem of language use.

126. Gabrielsson, Å., & Paulsson, M. (1989). Actors' general conceptions and strategies for local development: An application of Perspective Text Analysis. *Kognitionsvetenskaplig forskning*, No. 28; 0281-9864. [A draft of this article was presented in B. Bierschenk (Chair), *Ecological psychology*: *Human response to environmental change*. Symposium conducted at the Meeting of the First European Congress of Psychology, Amsterdam, The Netherlands.] (ED 312 714)

Abstract
The purpose of this paper is to examine the interdependence between actors' conceptions and local strategies for development. Two peripheral municipalities with development problems are compared. The municipalities have a shared history and culture and a similar economic life. Yet they seem to have different development strategies. In order to understand why, the significant actors are focused upon. Their basic set of ideas and conceptions are examined as an important basis for their interpretations of the local community's situation and thus for their actions. Depth interviews with two significant actors were analysed with a method - Perspective Text Analysis - applicable to natural text. The method works inductively and is subject-governed which means that the text producer - and not the researcher or any a priori theory - is the point of reference. The result of the text analysis is a conceptual structure, which describes and synthesises the text producer's consciousness. The result is visualised in a topographical representation of the cognitive processes as they emerge from the interviews. The two actors (A & B) were alike with respect to traditional characteristics of classification such as sex, age, education, professional background and party affiliation. Their general conceptions, however, could be ascribed to different traditions of ideas. The actors had disparate views of nature. There were differences in perspectives on time, in enacted problems, in perception of what is rational and reasonable as well as contradictions in society. Consequently they saw different solutions to the development problems. (A) was action oriented and expressed a conviction that the most urgent problem from his point of view - the local unemployment crisis - could be solved without radical changes. Adaptation to markets and structures and technical entrepreneurship were his solutions. (B), as well, perceived the local unemployment problem but far more fundamental was the threatening ecological crisis. He therefore advocated an ecological approach to development and demanded more radical changes in values and structures. One conclusion of the study is that there is an established connection between the significant actors' general conceptions and the local strategies.

127. Ottesen, C. (1989). Reconciling deductive and inductive approaches to work motivation by a syndetic. *Kognitionsvetenskaplig forskning*, No. 27; 0281-9864. [A draft of this paper was presented in B. Bierschenk (Chair), *Ecological psychology*: *Human response to environmental change*. Symposium conducted at the Meeting of the First European Congress of Psychology, Amsterdam, The Netherlands.]

Abstract
Theories of work motivation are reconsidered from F. W. Taylor to E. A. Locke. These are characterised by a behaviour paradigmatic point of view as either of analytic-deductive or analytic-inductive kind. Hence rationality is understood according to a determinism leaving rationality according to a moral point of view out of consideration. In order to incorporate human value into the study of work motivation a syndetic approach is called upon. This involves taking the point of departure in the schema concept of Kant, studying behaviour by means of the "Agent-action-Object" paradigm of Bierschenk & Bierschenk. The behaviour paradigmatic frame of reference is the process paradigm evolving from J. J. Gibson's theory of information-based perception.

5. Period: 1990-1999

5.1 Introductory Remarks

A fundamental fact of all living systems is that they are *"self-referential"* and thus that they contain their own description. Further, in departing from the fundamental schema-hypothesis that nature is the producer of language, the operationalisation of the schema requires that the steering and control mechanism, responsible for proper production becomes recognisable. From a strictly scientific point of view, however, it is not sufficient to take the point of departure in nature. Methodological considerations have to be based on a-priori assumptions. In the present context, the assumed basic principle, underlying all living systems is *the schema as the Axiomatic Foundation of the Steering and Control Mechanism for Design, Measurement and Representation of the Structure underlying Natural Language production.*

Design and measurement as well as representation presuppose a dual steering and control mechanism, which is anchored in the A-O-dependency of the Agent-action-Objective (AaO) paradigm. Furthermore, as the a-priori principle, the (AaO) is the foundation for the establishment of *"synthesis"* and consequently meaning. By this assumption, it is likewise stated that the principle is reflecting natural law. However, the reflection requires the introduction of a copy of the principle, which makes it functional: [AaO] $\rightarrow$ Functional Axiom. Hence, the functional schema, marked with [] implies a copying process, which is establishing the biological mechanism underlying natural language production. By this assumption it is meant that the principle becomes functional in the moment when a copy of its components is being realised. The notion "functional" refers to the production of a *"standard copy"*.

Each time such a copy is being copied, the copying process is carried out irrespective of its meaning. From an evolutionary point of view, however, it can be stated that irreversible time enters into the process and changing time makes the mechanism always departing from any strict or uniform reproduction. Hence, the mechanism is steadily producing new forms of expression. This condition is symbolised in the following way: [ØaØ] $\rightarrow$ Incompleteness.

When either the A-component or the O-component of the dual steering and control mechanism is missing [Ø] at the textual level, incompleteness is to hand. It is not out of place to mention that incompleteness has far-reaching consequences for the study of the [AaO] unity as the dynamical building block of natural language production. Except that duplication takes place in strictly mechanical terms, the co-operative interaction between covalent A's and O's is producing various displacements of the components through their *"dislocation"*. This condition is symbolised as follows: [Aa(Ø$_A$aØ$_O$)] $\rightarrow$ Interacting Sequence.

Hence, through dislocation of different components in the order of succession, every new language expression is establishing itself as a new form and the result of novel terminal states. When the language production process is ordering the copies in interacting sequences, evolutionary principles are governing the process, but this requires that some copies emerge incomplete. This circumstance is influencing profoundly both the evolutionary processes that generate radical flow morphologies and the *"channelling"* of the flows, which requires that channels are swiftly formed in order to transport the corresponding textual flows.

128. Bierschenk, B. (1990). The idealised world: A problem of semantics. *Kognitionsvetenskaplig forskning*, No. 31; 0281-9864. (ED 321 517)

Abstract
In a number of preceding articles having appeared in this series it has been demonstrated that the AaO paradigm can be used to develop a cognitive helical structure. The present article advances the process to the forth of five phases. Of the four dependent variables emerging at this stage, two will be discussed, namely (1) zero processing and (2) variations in form. The other two will be presented in a forthcoming article. A short introduction gives some of the basics that govern the process. The discussion of the variables begins with some arguments put forward within cognitive science. In agreement with the general conviction, symbol processing results in strings of symbols or sentences on which operations such as addition, deletion and insertion can be performed according to formally defined rules. By propositional knowledge statements about the world and by truth conditions, meaning of symbolic expressions is defined. But meaning, i.e. semantics, is not bound to a linguistic context of interpretation. As comprehensive term it denotes the "knowledge system underlying various approaches to natural language processing. A system's semantics represents the constructor's world view, but also a theory of how it shall be organised to enable disambiguation of strings of symbols. As a result, the conceptual base is constructed within formally different boundaries compared to the linguistic base. Thus, the semantic principle cuts across the linguistic – non-linguistic dimension. The implication rule of a semantic approach to interpretation and the processing of a conceptual base are discussed within the context of the degree of linguistic closeness of the meta-language used.

129. Bierschenk, B. (1990). Simulation of action-event co-operation: Emergence of knowing. *Kognitionsvetenskaplig forskning*, No. 32; 0281-9864. (ED 338 513)

Abstract
A graphical expression or display has to depict crucial structural qualities of thought in such a way that a person can capture its intention by extracting higher order components. These are assumed to be shapeless and formless. The present article gives a demonstration of what is meant by an experimental manipulation of the Function factor as well as of the outcome when both the Type and the Function factor are allowed to co-vary. When a psychological analysis is more oriented toward intra-personal instead of interpersonal aspects, it may be important to study the components that define tension in a person-environment system. But only the dynamic cooperation of the Type and Function factors leads to the abstraction of higher order functions, which seem to underlie any categorisation effort and hence the emergence of knowing. With the help of a series of "direct perception" experiments it is shown that direct perception captures the ecological significant aspect of a concept, demonstrated with the concept of growth.

130. Bierschenk, B. (1990). Behavioural semantics: A comparison between topologic and algebraic scaling in the measurement of human dignity. *Kognitionsvetenskaplig forskning*, No. 33; 0281-9864. (ED 320 914)

Abstract
This article is concerned primarily with the problem of measuring quality and/or quantity of psychological phenomena. Its purpose is to identify and examine the critical problem of qualifying a syntactic correct indicative statement. The exposition is based on the premise that both humanistic and behaviouristic oriented psychologists have agreed upon the necessity of the analytical proposition as foundation of all scientific inquiry. The disagreement is on the methodological approach. Humanists advocate the scientific study of immediate experience as the basis of psychology. Their focus is on the interpretive procedures they apply to events, occurrences and happenings as one experiences them. Analysis of the contents of consciousness is emphasised, because it gives the impression to permit direct access to the states of mind. Behaviourists, on the contrary, hold the position that a concept such as human dignity can only be recognized as scientific construction, if and only if the measurement operations yield sets of numbers that can be processed by statistical methods including techniques for drawing inferences. The presented results make evident that there is no scientific basis for a belief in the superiority of a humanistic approach to the structure and function of psychological phenomena.

131. Bierschenk, B. (1990). The topological scaling of consciousness: The world in the perspective of economists and technologists. *Kognitionsvetenskaplig forskning*, No. 34; 0281-9864. (ED 336 335)

Abstract
The article presents an analysis in which intentionality is the key concept in the measurement and representation of consciousness. It is shown that a psychological approach based on the animal mechanism out of which behavioural semantics has developed is wrong. By studying the local and global singularities it was possible to show that efficient transaction with the environment rests on the theoretical formulations that assume the cooperative interaction of a conscious organism with the environment. Moreover, consciousness cannot be specified as the outcome of dynamic brain patterns that have causal control potential. Consciousness must be defined as the synthesis of inquiry and not as the outcome of causal processes in the natural world. Without the use of intentional language and a topological analysis of the origin and type of events and actions in the surrounding world it is not possible to speak of consciousness. The topological analyses in the present experiment concern natural text that was produced by groups of students of Business Administration and Civil Engineering as well as professional economists as their response to the projection of a growth society. A comparison of the respective topological structure with the criteria stated in the article indicates a group difference in progression. It implies a conceptual development in which the resulting state or space phase of the groups is differentially specified. The distinctive aspects characterise the groups such that they can be ordered on a scale from non-consciousness to consciousness. Increasing consciousness implies increasing conceptual autonomy in the respective group's cooperation with its environment, and consequently, also an increase in its chance to survive in competition.

132. Bierschenk, B. (1990, December). Inter-European education: A question of culture or mentality. In H. Seel (Chair), *School 2020*. Symposium conducted at the Karl-Franzens-University, Graz, Austria. [Contribution published (1991) in H. Seel, & H. Stigler (Eds.), *Symposion Schule 2020: Herausforderung für Schule, Jugendarbeit und*

Familie durch neue Informations- und Kommunikationstechnologien (Challenge to school, youth-welfare and family by new information and communication technologies)(pp. 15-19). Wien-Linz: BMUK-KOPTEN. Particularities of the study have been published in 1987 in *Kognitionsvetenskaplig forskning*, No. 18; 0281-9864.]

Abstract
Societies oriented towards the development of high technology, like the Western World, are not only dependent on an unrestricted information flow, but demand more and more investments in education. Therefore, a new and deepening interest in the factors for possible conditions seems to appear in the public. One of the dominating hypotheses is that cultural conditions determine the basic presupposition for the development of competence and professional mobility. Against this background, it will be discussed to what extent the mechanics of two European industrial societies are in their professional behaviour culturally bound. The results to be presented have been computed on the basis of investigation of opinions, which has been carried out in the mid 80's by a Swedish multinational car maker.

133. Dahlgren, C. (1990). Mentality for mission in Christianity: A tutorial in the analysis of a curriculum vitae. *Kognitionsvetenskaplig forskning*, No. 35; 0281-9864. [Parts of this work have been presented (1991) in B. Bierschenk (Chair), *Mentality: representation and measurement*. Symposium conducted at the Meeting of the Second European Congress of Psychology, Budapest, Hungary.]

Abstract
During the 1800's interest in Christian foreign missions was established and flourished in Sweden. Several mission organisations were founded for the purpose of disseminating knowledge about the countries in which missionary activity was to be carried out. This was done in part to raise funding to support increased missionary activity and in part to recruit new candidates for the mission field. Missionary publications were one means of achieving this goal. An analysis of the content of the applications for admission to training school submitted by candidates for the mission field will reveal that the interest lying behind many such applications was sparked by reading a missionary publication. If, on the other hand, one studies only a single application with the aid of a method called Perspective Text Analysis this argument no longer appears to be tenable. Instead one gets a picture in which the applicant's religious growth and change, through education for example, form the central concern of the application document under scrutiny.

134. Bierschenk, B. (1991). Provision and preservation of knowledge: A department of educational and psychological research as laboratory for analysing scientific discourse. *Kognitionsvetenskaplig forskning*, No. 36; 0281-9864. (ED 331 488)

Abstract
Two kinds of perspectives governing the provision and preservation of knowledge, a universal and an ecological, are discussed in the present article. In the first case, scientific observations are represented through a semantic interpretation of facts. This is illustrated with a series of experiments on semantic feature perception in the recall of pictures that were described by descriptor terms. In the second case, scientific observations are conceived as part of a constitutive context. Consequently, the

researcher's (knower's) development toward structuralising and his use of precise concepts and well-defined conceptual relations require an orientation toward the cooperative dimension of the context. This is illustrated by an ecologically oriented study of an experimentally designed information system. Within this system the intentionality and orientation of the single researcher has been measured by means of the AaO formula, derived from the Agent-action-Objective paradigm. Within the AaO formula a strict dependency between the cooperatively operating and interacting components creates the absolute terms, i.e. the invariants. These invariants serve as point of departure for information synthesis, i.e. the establishment of knowledge. It is demonstrated that scientific reporting has the intermediary function between context and knowledge representation. Intentionality and orientation as reflected in the course of a document-event involvement is fundamental in the development of concepts and conceptual relations.

135. Bierschenk, B. (1991). The metaphor as instrument for naming the terminal states of ecological invariants. *Kognitionsvetenskaplig forskning*, No. 37; 0281-9864. (ED 338651)

Abstract
Implicit figuration and subjective interpretation make up the conventional basis of the classical discussion of the comprehensiveness and aesthetic quality of the metaphor. Its function and use in Social Science is illustrated as a background to a radical different methodological approach. By means of Perspective Text Analysis it is demonstrated that the metaphor has to be conceived as the Re-naming Instrument. The hypothesis tested is that the metaphor carries ecological information. The results of the analysis show that the metaphor has to be treated as a self-contained verbal expression of affordances. By naming the affordances, i.e. what object and events in the environment offer, events of a certain kind are brought into perspective.

136. Bierschenk, B. (1991). The schema axiom as foundation of a theory for measurement and representation of consciousness. *Kognitionsvetenskaplig forskning*, No. 38; 0281-9864. (ED 338 650)

Abstract
For the first time in the history of psychological and educational measurement the Kantian schema has been applied to natural language expression in a rigorous and precise way. The crucial novelty of the approach concerns the way in which the Kantian schema interrelates the analytic with the synthetic mode in the construction of the presented formalism. The main thesis advanced is based on the premise that the synthetic in contrast to the analytic proposition plays the central role in the measurement and representation of consciousness. It is assumed that the discontinuities in natural language production are the only reliable observations and that there is at present no other way in which these observations can be formalized. Despite the enormous number of textual elements and great variations, it has been possible to demonstrate empirically perspective and objective structures as the result of a series of non-deterministic bifurcations of a dynamic vector field within Euclidean space. By contrasting the caption to the picture series of the original Visual Cliff experiments with a narration produced in a single subject experiment, it was possible to show that the formalism has the capacity of dealing with alternative descriptions of one and the same system (experimental arrangement). On the basis of

the given theoretical outline, a totally new apprehension of 'text' and of the underlying theoretical concepts related to the ecological approach to visual perception has emerged.

137. Bierschenk, B. (1991). Mentality: Measurement and representation. *Kognitionsvetenskaplig forskning*, No. 39; 0281-9864. (ED 338 652)

Abstract
The scientific treatment of the concept of consciousness is multifarious. This has caused a number of different approaches. The present article gives some introductory account of the research on consciousness. However, the main hypothesis advanced is based on the premise that consciousness emerges from the cooperative interaction of multiple agents and agencies within naturally produced text. By means of Perspective Text Analysis it is demonstrated that the Kantian schema provides the necessary foundation for making explicit the teleonomic component governing natural language production. Thereby, the concept of text is redefined such that textual transformation and recursive restructuring become their meaning in relation to the concepts of textual dynamics and linkages. Its configurational architecture is demonstrated on the basis of the (AaO) formula. As a result the entirety of structural relations evolves as a double helical structure. Both have been analysed within the framework of differential topology in order to demonstrate the necessity of cooperating perspective and objective structures in establishing perspective and objective invariance.

138. Bierschenk, B., & Bierschenk, I. (1991). Towards a flow field model of language processing. In B. Bierschenk (Chair), *Mentality: Representation and measurement*. Symposium conducted at the Meeting of the Second European Congress of Psychology, Budapest, Hungary.

Abstract
The basic idea behind this presentation is that text can only be analysed with reference to somebody or something being its source. This means that there must be a person speaking or writing the text, some perspective by which it is produced, and a speaking or writing mechanism that transports linguistic form and organisation into structural information, i.e. text. In principle, there is nothing new in this statement. What is new, however, is that these relationships of text have been operationalised in a system of analysis, in which the transport mechanism makes possible the discovery of the structural information but is naturally separated from it. Traditional language models presuppose a 1-1 relationship between organisation and structure and, consequently, miss the perspective dimension. James J. Gibson (1979) made an important statement about environmental perception. Information exists in the form of a flow and can only be perceived when the perceiver is in locomotion. This means that perception of structure is a process, which comes about in the cooperation of the physical energy (force field) generated by the perceiver and the flow field formed by the environment. In this systemic cooperation between force and flow there are on the one hand laws pertaining to the physical properties of "the transport vehicle", such as size and weight (mass), constraining the energy produced, and constraints within the perceptual mechanism, widening or narrowing the information flow on the quality of the information flow on the other. The principal difference between energy and flow is that an observation and analysis of flow pre-requires the existence of energy but not the reverse. The consequences of this conformity to law are expressed in the way in

which the two language models are operationalised. The traditional model builds on energy constraints. The new model to be presented builds on informational constraints.

139. Pétursson, P. (1991). Svensk civilreligion med två ansikten: Palme och ärkebiskoparna (Swedish civil religion with two faces: Palme and the archbishops). *Kognitionsvetenskaplig forskning*, No. 40; 0281-9864. [A draft of this article was presented (1991, June) as 'Ecumenical and international solidarity in a political context' at the Nordic Research Course *Theories and Methods within Ecumenical Research*, Lund, Sweden.]

Abstract
Since the 1960's there has been increasing understanding and cooperation between the religious and the political spheres in Sweden, notably between the Church of Sweden and the Social-democratic Party. Both have been occupied with issues outside their traditional national and confessional boundaries. The question is whether and to what extent this has resulted in a "civil religion of the Swedish society" which unites the Church and secular politics in their striving for justice and peace in the world. We would expect this civil religion be expressed at joint meetings of the representatives of the Church and the Party. In this research report five speeches by leaders of the two bodies (Palme, 1965, 1968, and 1983 and the Archbishop 1968 and 1983) are analysed by the Perspective Text Analysis method. This method makes it possible to describe and analyse the speaker's conceptual structure, cognitive processes, level of argumentation and changes in these matters over the course of time in question. This description leads naturally to an analysis of the degree of compatibility between the cognitive representation of these speeches and the ideologies and strategies of the two bodies, but the present report only lays the groundwork for this further study.

140. Bierschenk, B. (1992). Measuring tacit knowledge. In W. Liebrand (Chair), *Computerised research methods for psychologists*. Symposium conducted at the Meeting of the 25th International Congress of Psychology, Brussels, Belgium. [Published in *International Journal of Psychology*, *27*, 375; 0020-7594.]

Abstract
A special purpose system of computer programs (PERTEX) is used for establishing a language space in which textual flow patterns occur, containing perspective and objective invariants. By applying this system to Tacitus' Germania as well as five different translations of the Latin text, it is shown that they can be contrasted on the basis of six different topological spaces containing the boundary conditions. Finally kinetic flow patterns have been coupled to kinematic flow patterns with the purpose of demonstrating whether and to what extent predictions of knowability can be made over levels of analysis.

141. Bierschenk, B. (1992, December). The Perspective Text Analysis. In B. Bierschenk (Chair), *Mentality: Representation and Measurement*. Workshop conducted at the Psychological Laboratory of the University of Copenhagen, Copenhagen, Denmark.

Abstract
Present workshop point towards the import of studying knowability. When social and natural science research is studying humans in interaction with various societies, the human factor becomes observed and analysed as an object. Independent of the interest

in the conditions of human life, the applied research methods are, unconditionally, governing the outcome. Therefore, the workshop illustrates the development of a theory and a method of analysis for the representation of knowability. It is shown that this condition requires that the specificity and uniqueness of the individual has to be made the foundation of research. The establishment of the dynamic basis for self-organisation and self-reference by means of text production together with an illustration of the developed algorithm for automatic processing has resulted in "Perspective Text Analysis", which is establishing procedures for the extraction of specificity. In terms of topological invariants, the workshop will present evidence for the invariant structure of a text example. The term "invariant" here means coordinate-free. As a result, it will be pointed out that the stitching device of Natural Language employs its own intrinsic systems of coordinates, but they are generally not known. Therefore, rules of performance, typical of intelligence testing, are of minor importance. Instead it is the individual perspective - knowability - that emerges out of the verbal flow.

142. Bierschenk, B (1992, December). Unfolded consciousness. In B. Bierschenk (Chair), *Perspective Text Analysis*. Workshop conducted at the Meeting of the First International Congress of Social Science Information Technology, Amsterdam, The Netherlands.

Abstract
In a most fundamental sense, science begins with the observation of discontinuity in natural phenomena and the study of natural language expressions is no exception. Furthermore, the development of consciousness and conceptual relations through the production of language expressions is one of the most fundamental and life-sustaining processes at the ecological level. Hence, at the human level, organism-environment interactions are synthesised into conceptual relations and manifested by stringing together graphemes and strings of graphemes of natural language. Strings are generated and composed into sequences, which are specified by their degree of rotation in a simultaneously developing language space. Hence, unfolding consciousness must begin with language processing, which means with the conversions of kinetic energy into graphemes and strings of graphemes. Thus, to discover the ideational structure of a sample text, one must be able to listen to the person's verbalisations or observe a person's way of writing observations into text. It follows that observations put into writing have the function of letting viewpoints as well as a perspective come into existence. This hypothesis is challenging the assumption that an internal organisation of ideas and out-flowing construction is based on "reflexes". When the origin of a behavioural expression is identified with the presence of a "reflex", it is equated with co-incidence. However, already in the beginning of the nineteenth century, it was shown that there is no strict recapitulation of any primitive form during a developmental course. Further, evolution requires that new forms of behavioural expression appear as a result of new terminal states.

143. Bierschenk, B. (1992). The referential reality of Sweden: A topological approach to the consciousness of high and low achievers. *Kognitionsvetenskaplig forskning,* No. 44; 0281-9864. (ED 354 263)

Abstract

The focus is on the degree of consciousness of one's own familiar surroundings by high and low achieving students of a technical Gymnasium in the City of Malmö, southern Sweden. Consciousness and its scientific foundation have been in the centre of interest in a series of experiments on the perspectivation of model-typical and proto-typical environments. The present experiment has been designed for continuation of this line. Its purpose is to give an account of the individual's consciousness of his referential society. On the basis of four experimental subjects as co-ordinate systems and bio-psycho-physical frames of reference, it is demonstrated that the order of performance can be upheld over levels of analysis Moreover, it is shown in what way the transformations of aggregates of joint textual element complexes become fashioned into single functional unities. On the basis of these unities absolute termini (limits) are established and named. These provide for the structural connections that specify the informational invariants of one's own referential reality. Likewise, these invariants serve as keys to consciousness in the Kantian sense, i.e. intuition, and thus give a precise phenomenological description of reality through systemic deduction.

144. Bierschenk, I (1992). A flow-field description of natural text production. In W. Liebrand (Chair), *Computerised research methods for psychologists*. Symposium conducted at the Meeting of the 25th International Congress of Psychology, Brussels, Belgium. [Published in *International Journal of Psychology*, *27*, 375; 0020-7594.]

Abstract

The basic idea behind this presentation is that text can only be analysed with reference to somebody or something being its source. This means that there must be a person speaking or writing the text, some perspective by which it is produced, and a speaking or writing mechanism that transports linguistic form and organisation into structural information, i.e., text. In principle there is nothing new in this statement. What is new, however, is that these relationships of text have been operationalised in a system of analysis, named Perspective Text Analysis, in which the transport mechanism makes possible the discovery of the structural information but is naturally separated from it. Traditional language models presuppose a 1-1 relationship between organisation and structure and, consequently, miss the perspective dimension. James J. Gibson (1997) made an important statement about environmental perception. Information exists in the form of a flow and can only be perceived when the perceiver is in locomotion. This means that perception of structure is a process, which comes about in the cooperation of the physical energy (force field) generated by the perceiver and the flow field formed by the environment. In this systemic cooperation between force and flow there are on the one hand laws pertaining to the physical properties of "the transport vehicle", such as size and weight (mass), constraining the energy produced, and constraints within the perceptual mechanism, widening or narrowing the quality of the information flow on the other. The principal difference between energy and flow is that an observation and analysis of flow pre-requires the existence of energy but not the reverse. The consequences of this conformity to law are expressed in the way in which the two language models are operationalised. The traditional model builds on energy constraints, the new model to be presented builds on informational constraints.

145. Bierschenk, I. (1992). The pendular movement of text building. *Kognitionsvetenskaplig forskning*, No. 42; 0281-9864.

Abstract
Classical theories of language concern the establishment of constituents with the purpose of describing the organisation of text within the framework of classical mechanics. The novelty in the approach presented in this article lies in a multiple dynamic pendular system that enforces a strict regime on text building behaviour. The working of this mechanism is demonstrated by means of twenty model typical examples. On the basis of these examples, it is concluded that texture and structure converge into a textual whole, that is, into a body of language.

146. Bierschenk, I. (1992, December). The pendular movement of text building. In B. Bierschenk (Chair), *Mentality: Representation and Measurement*. Workshop conducted at the Psychological Laboratory of the University of Copenhagen, Copenhagen, Denmark. [Published in *Kognitionsvetenskaplig forskning*, No. 42; 0281-9864.]

147. Bierschenk, I (1992). An excursion into the ecological co-ordinates of language space. In B. Bierschenk (Chair), *Perspective Text Analysis*. Workshop conducted at the Meeting of the First International Congress of Social Science Information Technology, Amsterdam, The Netherlands. [Published in *Kognitionsvetenskaplig forskning*, No. 43; 0281-9864.]

148. Bierschenk, I. (1992). An excursion into the ecological co-ordinates of language space. *Kognitionsvetenskaplig forskning*, No. 43; 0281-9864.

Abstract
This article should be regarded as a position paper, which outlines an ecological theory of language. The paper makes the analogy between the physical and mental growth of a human being and the rhythmic movement of writing and textual development. Thus text building is conceived of as a process developing into a structural whole. This process is inherent in the language mechanism. The paper describes the way this mechanism operates to form a structural whole out of the natural distortions in the flow of information on the textural surface.

149. Helmersson, H. (1992). Main principles for Perspective Text Analysis via the PC-system PERTEX. *Kognitionsvetenskaplig forskning*, No. 41; 0281-9864. (ED 352 405). A version of this article was presented in W. Liebrand (Chair), *Computerised research methods for psychologists*. Symposium conducted at the Meeting of the 25th International Congress of Psychology, Brussels, Belgium. [Published in *International Journal of Psychology*, *27*, 375; 0020-7594 as well as in B. Bierschenk (Chair), *Perspective Text Analysis*. Workshop conducted at the Meeting of the First International Congress of Social Science Information Technology, Amsterdam, The Netherlands.]

Abstract
The principles for Perspective Text Analysis has been implemented into the PC-system PERTEX. The analysis starts from normal text and ends up in a topological representation of the mentality the text presents. The text material is processed by the

following main steps: (1) Coding of function words by means of a special dictionary, (2) design and coding of blocks according to the AaO-paradigm, (3) supplementation of A- and O-dummies, (4) generation of A/O-matrixes, (5) cluster analysis based on generated matrixes, (6) topological presentation of outcomes. PERTEX gives an integration of all the steps in the analysis and the user is offered a lot of comprehensive functions for automatic coding and control of syntax. By a multilingual design PERTEX can operate on texts in different languages. The user can select different menu-languages for the interaction with PERTEX.

150. Bierschenk, B. (1993). The fundamentals of Perspective Text Analysis. *Kognitionsvetenskaplig forskning,* No. 45; 0281-9864.

Abstract
The major assumption made is that language as a natural system is both self-organising and self-referential. Compared to common syntactic-semantic approaches, the present approach is ecological and builds on the unambiguous identification of textual agents and agencies together with their objectives. Because information transaction cannot be studied without an emphasis on the text producer's text building behaviour, his intended and oriented schematising as unitising activity has been focused upon. The main principles making up the foundation of Perspective Text Analysis (PTA) are presented in the form of 15 propositional statements. These are discussed with a stress on the involved dynamic formalism that creates co-operation and interaction between various (AaO) unities. This implies a stress on analysis and synthesis of the morphogenesis of conceptualising processes. It follows that PTA traces the transformations involved in the aggregation of (dis)joint textual elements into systems. These may be characterised by particular geometric profiles specifying the boundary conditions of the language space in which the verbal flow patterns occur, containing the perspective and objective invariants of a particular configuration.

151. Bierschenk, B. (1993). The tacitness of Tacitus: A methodological approach to European thought. *Kognitionsvetenskaplig forskning,* No. 46; 0281-9864. (ED 388 038; PsycINFO, AN: 80-32773)

Abstract
In the present study, emphasis is put on two kinds of measurement. One concerns the analysis of verbal flows by means of Volume-Elasticity measures. The other is directed toward the analysis of information flow structures and their representation in the form of a Metaphysical Cube. Because information transaction cannot be studied without an emphasis on the text producer's text building behaviour, his intended and oriented schematising as unitising activity has been focused upon. To get this problem under experimental control, Perspective Text Analysis (PTA) has been instrumental in tracing the transformations involved in the aggregation of (dis)joint textual elements into systems that are characterised by particular topological profiles specifying boundary conditions. A special purpose system of computer programs (PERTEX is used for establishing the language space in which the textual flow patterns occur containing the perspective and objective invariants. By applying this system to Tacitus' Germania as well as five different translations of the Latin text, it is shown that they can be contrasted on the basis of six different Metaphysical Cubes containing the boundary conditions. Finally kinetic flow patterns have been coupled to kinematic flow patterns with the purpose of demonstrating whether and to what extent

predictions can be made over levels of analysis. The similitude between degree of forcefulness in text writing and degree of defensive thinking is the remarkable outcome. Moreover, "limes of thought" is demonstrated between Swedish, Danish, and German on one hand and Ancient Roman, French, and British on the other.

152. Bierschenk, B. (1993). An experimental approach to the functional analysis of text building behaviour: Part I. The verbal flow. *Kognitionsvetenskaplig forskning,* No. 47; 0281-9864. (ED 376 192)

Abstract

This presentation is based on a method for analysing the verbal flow in text building behaviour. This method is called Perspective Text Analysis (PTA). It locates and makes use of the discontinuities in produced text. Its task is to characterise the mechanism that governs language production and to foster an understanding of the actual processes of movement in language. The study of this phenomenon is founded on the experimental conditions provided by the famous Visual Cliff. It is assumed that informational invariants are established through the production of experimental text. Through the behavioural dynamics produced by four experimental subjects, the metrical structure of the co-ordinates of a language space has been established. Furthermore, it is shown that kinetic properties, like velocity and direction, of a verbal flow can be measured and represented by means of a simple regression analysis. Its slope coefficient gives expression to the degree of deviation in the curvature of the measured space. The results of the regression analysis are represented in a log-by-log plot. This plot shows that the verbal flows of the studied systems are characterised by highly similar kinetic properties.

153. Bierschenk, B. (1993). An experimental approach to the functional analysis of text building behaviour: Part II. The information flow. *Kognitionsvetenskaplig forskning,* No. 48; 0281-9864. (ED 376 193; PsycINFO, AN: 82-12291)

Abstract

In contrast to the mass-related verbal flow description, given in Part I, the present one focuses on the significance of the co-operative interaction of textual agents and objectives in the production of information flows. Perspective Text Analysis (PTA) is used with the purpose of establishing their physical and functional significance in a non-mass based description of text building behaviour. The most important feature of Part II is the double aspect in the methodological approach to text building. One is concerned with an elaboration of Gibson's methodology into the study of a language specific pickup of ecological invariants. It means an exploration into the abstract projections of ecological optics onto language spaces and the way in which projected optical flow fields constrain the coupling of perception and action, i.e. locomotor activities. The other refers to their physical conditions as provided by the famous Visual Cliff experiments and their theoretical significance in an explanation of the established temporal morphologies. These have been represented within a topological space. This space is conceived of as a collection of points that are connected by affinity relations determining the A's and O's of the AaO schema. It is shown that each point can be represented by a different number and that the concentration of these points in the topological space ultimately becomes helical. Finally it is demonstrated that self-reference and self-organisation has significance for the embedding of the perceived topological properties of the experimental environment into text. The results

of the presented analyses show that the ensemble of texts macroscopically is dominated by highly similar flow field properties.

154. Bierschenk, B (1993, November). The synthetic approach to competence. In W. Langthaler, & G. Schiepek (Chair), *Self-organisation and dynamics of social systems*. Symposium conducted at the Department of Psychology I: Psychological Diagnosis and Clinical Psychology of the Westfälische Wilhelms-University, Münster, Germany.

Abstract
In the study of competence at least two approaches can be discerned. One favours the assumption of a hereditary basis. Following this tradition, it is asserted that competence develops on the basis of an inborn capacity of performing means-ends analyses. Thus, cognitive endowment determines what kind of scholastic and occupational tasks become mastered. The other line of research assumes that cultural factors operate and that the impact of schooling effects competence the way it becomes visible through professional mobility. The fundamental problem with these approaches is related to the analytic treatment of competence. A topological approach to competence instead emphasises as a matter of fact its evolutionary and consequently synthetic quality. By embedding it functionally into a context and approaching it with Perspective Text Analysis (PTA) four types of competence development have been demonstrated. By means of global attractors developing in a phase space, behavioural expressions of competence have been identified. These are taken as indicators of functional stability in the development of competence.

155. Bierschenk, B., & Bierschenk, I. (1993). Perspektivische Textanalyse (Perspective Text Analysis). In E. Roth (Ed.), *Sozialwissenschaftliche Methoden (Social Science Methods),* (3rd ed., 175-203); 3-486-23284-3.

Abstract
To an ever-increasing extent, in scientific investigations of various kinds are data collected, which consists of verbal expressions. They may have been generated through verbal presentations, personal interviews, open questions or written accounts. Therefore, it is not unusual that an investigator is confronted with data collections that appear to be "unstructured" and of an extent that it seems to be an insurmountable task to extract the information content with so-called informal methods, like content analysis. However, those difficulties can be bridged over with a discussion of the function of language. But this would require a stance on a strategy that can cope with the cognitive ability of the individual information provider, i.e., to express an idea or an opinion, without loosing in formal capacity and stringency.

156. Bierschenk, B. (1994). The expression of competence through a functional analysis of qualitative stability in text building behaviour. In B. Bierschenk (Chair), *Competence development*. Symposium conducted at the Meeting of the 23rd Congress of the International Association of Applied Psychology, Madrid, Spain.

Abstract
This presentation is based on a method for competence assessment that allows an entirely different approach to its study. The method builds on the functional analysis of text building behaviour. In this respect it makes use of the discontinuities as the only reliable observations from a scientific point of view. It follows that the study of

expressions of competence through text building behaviour is founded on the modern theory of stability and bifurcation. The method has been made known as Perspective Text Analysis (PTA). Its task is to characterise the mechanism that has been discovered to govern text production. PTA incorporates the double aspect of time into the approach. An algorithm takes care of (1) the dynamics in text building and (2) the sequencing that secures its evolutionary or developmental aspect. Results will be presented within different areas of professional life. These demonstrate that temporal morphologies can be established as expressions of the kind of evolutionary processes that govern competence development. These will be presented within topological spaces. By means of global state attractors, various behavioural expressions of competence will be identified and compared. These are taken as indicators of different degrees of functional stability in the development of competence.

157. Bierschenk, B. (1994). A model for explorations into cognitive science research. *Kognitionsvetenskaplig forskning,* No. 49; 0281-9864. (ED 376 194)

Abstract
Because computer-oriented researchers apply cognitive notions such as meaning, symbol and understanding, or concept, cognition and knowledge, it has become mandatory to inquire into the traditional explanatory models of science, including behaviourism. The article outlines the steering and control mechanism that has governed a new outlook in which subjective mental states become functionally interactive and essential for a full explanation of conscious behaviour. The presented model has governed a comprehensive exploration into Cognitive Science. Its purpose was to digest the viewpoints of "hard" science and to compare the transformation with the value-assumption underlying many of the approaches favoured by behavioural scientists. Advanced methods have been developed. For this reason, they have been analysed with respect to changes in both intention and orientation. These processes are highly dependent on the relations between natural language expressions and their underlying mentality. It is demonstrated that the frequently occurring non-additive effects of cognitive functions as design variables necessitate a research effort that concentrates on the instrumental functions of natural language. Each of the identified functions is studied as variable on the basis of a recurrent two-by-two factorial design. The approach stresses the fact that a variable in one developmental phase is treated as independent variable, whereas its re-appearance in the succeeding phase results in its treatment as dependent variable. The study of co-variation and interaction of the variables seems to be the only way to shed light on the confounded discussion of the traditional science-value dichotomy in Cognitive Science. The new methodological approach consists of a calculus that preserves responsibility as its constituent component. The calculus has progressively been introduced during the development of the presented double helical architecture, which is the result of an unfolding of the AaO-formula into a cognitive system.

158. Bierschenk, I. (1994). The language space as indicator of competence potential. In B. Bierschenk (Chair), *Competence development*. Symposium conducted at the Meeting of the 23rd Congress of the International Association of Applied Psychology, Madrid, Spain.

Abstract
Fundamental to the presentation of this paper is the assumption that the ability of developing competence in various contexts is inborn. By means of a genetically rooted mechanism called schema the individual develops an ability to adequately co-ordinate structures emerging in the environment with structures integrated in the mental space. Language functions as the intermediary system for both the forming and the textual representation of this space. Recent research has shown that (1) syntax is prior to lexicon and morphology for the measurement of language space and that (2) the flow of a text as provided by syntax is dynamic and can be measured as to its "viscosity-elasticity" gradient. The paper presents an experiment on texts collected from a discourse situation where professional competence is highly needed. The method applied is Perspective Text Analysis (PTA), which provides for the distinct separation of time and length in the rhythmic movement of text building. Results from this study show that the language space, as determined by the viscosity-elasticity relationship, is a more reliable indicator or an individual's potential for competent action than are surface features determining, for example, high notes on essay writing.

159. Bierschenk, I. (1994). The language space. Proceedings of the 14th Scandinavian Conference of Linguistics and the 8th Conference of Nordic and General Linguistics. General Session (Vol.1). *Gothenburg Papers in Theoretical Linguistics,* No. 69, pp. 49-59; 91-972408-0-X.

Abstract
The theoretical assumption put forward in the present paper is that text is a natural phenomenon, whose development is governed by inner dynamics, as regular as regards any living system. This dynamics becomes accessible through the language mechanism. Through language an individual forms his inner mental space into a textual representation. On the surface, because of writing conventions, the text is linearly progressing. Its inner dynamics thus outlined cannot be measured by ordinary frequency counts or relational indicators, since those measures pre-require materialisation. Perspective Text Analysis (PTA) is a new methodological development, which handles both the verbal flow and the information flow in text production. The presentation gives a short outline of some of the fundamentals of PTA and shows in what way both flows can be linked in an analysis over levels.

160. Caramelli, N., & Borghi, A. (1994). The relational structure of conceptual knowledge. In B. Bierschenk (Chair), *Competence development*. Symposium conducted at the Meeting of the 23rd Congress of the International Association of Applied Psychology, Madrid, Spain.

Abstract
The presentation builds on the assumption that competence consists of a non-conscious set of rules underlying peoples' performance of a task. The set can be defined very broadly. Thus, established relations between objects or concepts can be included and considered to be part of the definition of competence. On these assumptions, different kinds of relations that children develop as part of their conceptual knowledge were assessed. 240 children (5, 8, and 11 years of age) were tested on a free association task. They had to produce as many associated concepts as they could to a set of concepts. The determined limits were a minimum of five and the maximum often. From a source of 12 concepts, three belonged to a taxonomic, three

to a thematic, and three to an artifact category. The items in each category represent the basic, super-ordinate, and subordinate levels. The results show, that not only the quantity, but also the quality of produced relations will increase with age and differ according to the kind of category as well as to the level of the item. A better knowledge of the relations used in linking conceptual knowledge will prove useful in developing specific expertise.

161. Elstrup Rasmussen, O. (1994). The significance of self-identity in the synthetic development of competence. In B. Bierschenk (Chair), *Competence development*. Symposium conducted at the Meeting of the 23rd Congress of the International Association of Applied Psychology, Madrid, Spain.

Abstract
The presentation gives a reasoned account and a concise outline of a model that fosters a synthetic approach to competence. While the analytically oriented models make the tacit assumption that one can gain algorithmic control over one's environment, the proposed model assumes that the individual-environment involvement is formed on the continuously ongoing process of knowing, which is the result of becoming. Synthetically conceived, enactment is governed by the logic of discovery and innovation and, consequently, based on personal concepts that are actualised by intentionality and orientation. The hypothesis put forward presumes that personal concepts exist as a complicated order, which may be called the individual's self. Moreover, the self is describable on the basis of all concepts available to the individual in any particular situation, whether one is aware of this or not. It is suggested that a conceptual order of a certain kind may exist on various levels of generalisability. Its highest level would address self-identity. It is argued that the individual while enacting his environment produces an actual genesis of the situated self-identity. Conceptually this would mean a reorganisation of the structure of personal concepts. Concluding, competence then is the way in which the individual is able to organise his personal concepts in a manner that makes any situation sensible.

162. Elstrup Rasmussen, O. (1994). The discontinuity of human existence: Part I. The fundamental concepts of human existence and the relation between the singular and the super singular. *Kognitionsvetenskaplig forskning*, No. 50; 0281-9864. (ED 389 230)

Abstract
The objective of this and the two forthcoming articles is to describe the fundamental discontinuities of human existence. The reason for starting with entrepreneurship is twofold. The entrepreneurial sciences represent a tradition the subject matter of which is change, and the relation between the singular and the super singular constitutes a problem which has frustrated the cognition of human activity. The analysis of some classic theories of entrepreneurship shows that - given a sufficient level of generalisation - a small number of concepts is sufficient to model entrepreneurship within economics. The analysis, however, shows that economics alone cannot describe entrepreneurship. Psychology must be included. But it also reveals that current psychological research is unable to solve the problems of entrepreneurship. Finally, the analysis finds that an un-clarified relation between the super singular and the singular constitutes an obstacle for the modelling of entrepreneurship. To remove this obstacle some classic theories are analysed. Concurrently, it is the objective of the

analysis to consider whether a set of fundamental concepts of human existence appears across the theories. The conclusion of the analysis is that the classic theories cannot solve the problems rising from the relation between the singular and the super singular, although these theories, to some extent, have produced the means to do so. It is shown that the analytic and the dialectic logic, being the matrices of the analysed theories, are able to explain the forms of existence that are under control, but the underlying stream of uncontrolled and uncontrollable social processes are not conceived as anything but prerequisites of the control processes. Consequently, the analysis suggests that it is necessary to disengage the fundamental forms of development from their present theoretical bindings. If the problem of the relation between the singular and the super singular is to be solved, the dialectic as well as the analytic logic, has to be neutralised. It is also suggested that the modern complexity theories could be the means of obtaining a more profound understanding of the uncontrolled human existence. Further, it is shown that the analysed theories have a few fundamental concepts of human existence in common: *canalisation,* encompassing transference of something from one to another, *correlation,* encompassing reciprocity which forms the basis of generalisation and *combination,* encompassing the production of the new. The theories also point to self-reference, although this concept does not have a completely transparent status in all the theories. And finally the theories bring to attention the fact that it is necessary to determine whether human existence is to be viewed in a local or global perspective.

163. Elstrup Rasmussen, O. (1994). The discontinuity of human existence: Part II. The general and the specific theories of discontinuity. *Kognitionsvetenskaplig forskning,* No. 51; 0281-9864.

Abstract
This is the second article in a series of three, the objective of which is to describe the fundamental discontinuities of human existence. In part I: *The Fundamental Concepts of Human Existence and the Relation between the Singular and the Super Singular,* it was concluded, among other things, that the theories analysed had a number of fundamental concepts of development in common: *canalisation* that encompasses transference of something from one to another, *correlation* that encompasses reciprocity which is the basis of generalisation and *combination* that encompasses the production of the new. It was also emphasised that the classic theories pointed to the problem of *self-reference.* In the first section of this article, the problem of self-reference is outlined at a high level of generalisation. It is argued that the structure-oriented philosophers, Kant for example, try to solve the problem of self-reference in the *time-space* dimension, while the process-oriented philosophers, Hegel for example, try to solve the problem in the *developmental* dimension, and that both trends claim that *difference* is the foundation of human existence and, by that, self-reference. It is concluded that the two trends cannot solve the self-reference problem. Furthermore, as the self-reference problem cannot be solved, it is argued that self-reference might equally well be claimed as a prerequisite, that is, a non-cognisable degree of freedom which governs human existence. Thus, the founding propositions of the discontinuity theory state that human existence subsists as difference, time-space, development, and self-reference. In the second section, it is primarily claimed that human existence can be modelled as discursive strings, the general form of which is ......(Aa(AaO))...... The discursive string encompasses a context-agent enacting an agent enacting an objective, where the objective itself can be an agent enacting an

objective, etc. The general theory of discontinuity modelled, among other things, by means of catastrophe theory, is described in section two. The general discontinuity theory models the *implicate order* of human existence determined by the degrees of freedom: difference, time-space, development and self -reference. Within the general theory it is shown that the founding implicate order of the ......(Aa(AaO)) ...... string can be conceptualised by the agent concepts: attention, positioning and intention, and the concepts of objective: designated difference, category distance and category orientation. The third section encompasses the specific theory of discontinuity which builds on the heritage of the classic theories analysed in part I. The theory encompasses three different forms of development: *canalisation* which includes the process of *perspectivizing, correlation* which includes the process of *systematising,* and *combination* which encompasses the process of *organising.* Because of the three developmental processes, the person, for example, obtains the *qualifications* to put his existence in *order* in a *perspective* manner and acquires the *competence* to make *sense* of his existence in a *perspective* manner. The specific theory of discontinuity also suggests a solution to the problem of the relation between the singular and the super singular, as it claims that the singular and the super singular are but different expressions of the same fundamental structures and processes of human existence. There is no relation between the minor and the major as they are but different levels of generalisation.

164. Elstrup Rasmussen, O. (1994). The discontinuity of human existence: Part III. Perspective text analysis. A methodological approach to the study of competence. *Kognitionsvetenskaplig forskning*, No. 52; 0281-9864. (ED 389 231)

Abstract
This is the last article in a series of three, the objective of which is to describe the fundamental discontinuities of human existence. In the first article: *The fundamental concepts of human existence and the relation between the singular and the super-singular*, it is shown, among other things, that a number of classic theories have three fundamental concepts of development in common: *canalization* that encompasses transference of something from one another, *correlation* that encompasses reciprocity which is the basis of generalization, and *combination that* encompasses the production of the new. It is also emphasized that the classic theories poin to the problem of self-reference.In the second article: The general and specific theories of discontinuity, the problem of self-reference is outlined at a high level of generalization and it is argued that self-reference and three other degrees of freedom: development, time-space and difference govern human existence. The general discontinuity theory, then model the *implicate order* of human existence by claiming that human existence unfolds as discursive strings, the general form of which is ……(Aa(AaO))…… The discursive string encompasses a context-agent that enacts an agent that enacts an objective, where the objective itself can be an agent that enacts an objective, etc. Within the general theory of discontinuity, a specific theory which builds on the heritage of the classic theories analyzed in the first article, is outlined. The specific theory claims, among other things, that the person, because of three founding developmental processes: systematizing, perspectivizing and organizing, obtains the *qualifications* to put his existence in *order* and acquires the *competence* to make *sense* of his existence. The Discontinuity theory exists at a high level of generalization, which means that the theory itself cannot conceptualize the diversity of human existence. Therefore in order to model the diversity of human existence, a method is needed. This method must be

capable of analyzing and systematizing the empirical foundation of the theory within the frame of the theory itself. *Perspective Text Analysis,* which is describe ed in this article, has these qualities, as it unfolds the core of the Discontinuity theory, namely self-reference in the form of competence. In a synthetic way, Perspective Text Analysis is able to analyze and to map the way in which a person makes sense of a situation. The article encompasses a description of the founding propositions of Perspective Text Analysis, which also builds upon the idea that human existence unfolds as discursive strings, the general form of which is ……(Aa(AaO))……. Further, the article includes a description of the technology of the method, and a simple illustrative example that aims to show the difference between an analytic and a synthetic approach to the modelling of competence.

165. Larsson, M. (1994, July). Parental competence and child impairment. In B. Bierschenk (Chair), *Competence development.* Symposium conducted at the Meeting of the 23rd Congress of the International Association of Applied Psychology, Madrid, Spain.

Abstract
This paper is devoted to a study of the competence that a parent might develop when faced with the task of taking care of a possibly handicapped or impaired child. The services offered by a rehabilitation clinic in the Southern Region of Sweden (consisting of counselling and physical therapy) constitute the context for an interview study with five families involved. The parents were partly questioned on the basis of structured interview forms, partly interviewed in less structured ways. The results to be reported concern the interviews conducted at the time when the child was between three and six months of age. The method applied to the verbal data is called Perspective Text Analysis. This method produces mental profiles through which cognitive processes and structural relations become available. These shed light on what kind of competence parents are capable of developing when faced with a child that had experienced a priori or post natal trauma, despite the fact that the consequences of the early trauma are still unclear.

166. Ottesen, C. (1994, July). On the moral dimension of management. In B. Bierschenk (Chair), *Competence development.* Symposium conducted at the Meeting of the 23rd Congress of the International Association of Applied Psychology, Madrid, Spain.

Abstract
Forces generating economic activity of man are discussed. Taking point of departure in the process paradigm of scientific thought on human behaviour, the dimension of morality is brought into the discussion, "morality" being the concept representing the heuristic nature of man's actions. As far as views of morality is concerned a distinction is made between two, the one imbedded in and as such the generator of the consumptive ecological orientation, the other being the generator of a productive ecological orientation. Based upon previous findings it can be concluded that in man's ever-changing world, only a view of morality generating the productive orientation to information pick-up promotes man's adaptive potential. The assertion to be discussed here is that the official view of morality dominating economic activity today implies putting undue constraints upon the promotion of man's adaptive potential in managing economic activity.

167. Bierschenk, B. (1995). The Assessment of competence: A new field of research. *Kognitionsvetenskaplig forskning,* No. 54; 0281-9864. (ED 405 342)

Abstract

Based on the typical tasks required in ability testing, a general conclusion drawn in the international research literature is that intelligence is not different from e.g. McClelland's achievement testing. To many psychologists this means that the concept of competence is insignificant and that intelligence as well as related aptitude tests are sufficient in the assessment of performance. Further, it is generally assumed that the intelligence quotient (IQ) constitutes a measure of cognitive development. Moreover, it is believed that the IQ correlates more or less perfectly with intellectual achievements. These assumptions are challenged because they are the result of obvious misconceptions. The present article is about a new method for competence assessment and allows an entirely different approach to the study of the sources and conditions of competence development. The method builds on the functional analysis of text building behaviour. In this respect it makes use of discontinuities in produced text as the only reliable observations from a scientific point of view. The method has been made known as Perspective Text Analysis (PTA).Its task is to characterise the mechanism that has been discovered to govern text production and to foster an understanding of the actual processes of movement in language. It follows that the study is on the expression of competence through a functional analysis of qualitative stability in text building behaviour. This incorporates the double aspect of time into the approach, partly by means of an algorithm that takes care of the dynamics in text building behaviour, partly through the sequencing in text production that secures its evolutionary aspect. By means of global state attractors resulting from the perspectivation of anticipated consequences, mental determinants are presented. On the basis of established temporal morphologies, it is shown what kind of determinants constrains one's thinking under varied experimental conditions.

168. Bierschenk, B. (1995). A demonstrative definition of consciousness in monozygotic twin. *Kognitionsvetenskaplig forskning,* No. 55; 0281-9864.

Abstract

The presented study builds on the Agent-action-Objective (AaO) principle. It accommodates a unique theoretical framework for the development of a radically new methodological approach to the scientific study of intentionality and orientation. This approach will be called Scanator. It provides the means for rigorous measurement and representation of such mental phenomena as consciousness and consequently the subtle structures of mentality. Fundamental to this methodological development has been the idea of analysing discontinuity and qualitative stability in text building behaviour. Through the approach taken, it has been possible to discern the teleonomic component, which is essential for the observation of phase transition and for evaluating its achievements. The presented study concentrates on the functional analysis of text building. In this respect, identification of textual agents and objectives as the originators of the co-ordinates of a language specific workspace help in the establishment of the mental structure underlying natural language production. In the present context, mass-dependent and forceful interactions are restricted to the verbal flow processes involved in text production. Mass-independent and informational interaction on the other hand is reflected through the thermodynamic processes that produce the style of writing. The observable variables at the kinetic level show that

monozygotic twins in their text production have been working in highly similar fashion. Though differences emerge when the perspective of the text producer is separated from his viewpoints. A consequence of this operation appears at the thermodynamic level where distinct differences in consciousness can be demonstrated between the twins.

169. Bierschenk, I. (1995). The ideology of pure form. *Kognitionsvetenskaplig forskning,* No. 56; 0281-9864.

Abstract

Ever since Chomsky published his work on the syntactic structures, linguists, AI-researchers, philosophers and psychologists have been obsessed with trying to prove the relevance of the formalism that his work advocates. The Chomskyan tradition assumes that the automaton represents the highest form of knowledge, and that, therefore, knowledge of language exists only as propositions. In the later works of Chomsky, the X-bar theory, especially its minimalist version, is proposed to be a purified development of the early theory. However, an examination of the old phrase structure tree compared to the principle of maximal projection in its symmetric as well as anti-symmetric versions for representation makes it evident that the logical machinery operating on language has no possibility of representing structure, since its basic assumption, in the 1990's as well as in the 1960's, rest on the idea of universality. The missing links for representing human (natural) language are intentionality, orientation, and biological time.

170. Caramelli, N., & Montanari, A. (1995). Animal terms in children's metaphors. *Kognitionsvetenskaplig forskning,* No. 53; 0281-9864. [The research of this article was presented at the 6th International Congress for the Study of Child Language in 1993, June, Trieste, Italy.]

Abstract

This research aims at showing that children shift their interpretation of the same metaphor according to the social role respectively of the speaker and the addressee of the sentence, to the degree of lexicalisation of the metaphor, and to their age. We chose the simplest type of metaphorical sentence, i. e., the 'nominal' one in the form 'X is a B', where X was a proper name and be an animal term. The twelve animal terms used produced six lexicalised and six new metaphors. Every metaphor was embedded in four different short stories describing the setting in which it was uttered: in the first speaker and the addressee were both children, in the second speaker was a child and the addressee was a teacher, in the third it was the reverse and in the last the speaker and the addressee were both teachers. The forty-eight stories obtained were told individually to seventy-two children aged six, nine and twelve. At the end of the story the experimenter asked the child what the speaker intended to mean, why, and whether he had positive or negative feelings for the addressee. The paraphrases the children gave for each metaphor were analysed with instruments typical of textual data analysis. Furthermore the data were tabulated as to the perceptual dimensions: shape, colour, sound, movement; physical or moral evaluation; and positive or negative connotation. On these data too several statistical analyses were performed.

171. Bierschenk, B. (1996). Emergent novelties in the mentality of dizygotic twin. *Kognitionsvetenskaplig forskning,* No. 57; 0281-9864. (ED 397 941)

Abstract

An extension of the application of the Scanator to dizygotic (DZ) twin is the concern of the present study. Scanator is an extremely valuable tool in the functional analysis of qualitative stability in text building behaviour. Moreover, Scanator allows for a detailed investigation of subtle changes emerging in the structural relations of emergent novelties. One goal of the present study concerns a most rigorous power test of parameter operations in relation to corresponding model components. No systematic differences are evident. Concerning the measures of the MLT units a powerful effect exists in the viscosity of the produced verbal flows. In contrast no such effect is evident in the elasticity of the volume flows. A certain invariance of this effect over levels of analysis is present. What remained invariant becomes obvious in the conceptual identity as produced by one twin. In contrast, the performance of other twin gives evidence to a refined conceptual structure where the global attractor has gained in abstractness.

172. Bierschenk, B. (1996). Degree of consciousness in the communication of action and events on the visual cliff. *Kognitionsvetenskaplig forskning,* No. 58; 0281-9864. (ED 404 351)

Abstract

This article has its focus on the consciousness of dizygotic twins in their communication of actions and events as perceived on the visual cliff. In the process of communication many different state spaces are generated. From a methodological point of view, it is demonstrated that the ecological and biophysical properties of language produce unique morphological profiles. Based on experimental data, collected from a male and a female pair, kinetic and kinematic invariants have been extracted. At the kinetic level, stable relations are identified among naturally occurring periods, mass and length of text. The relating invariants are demonstrated on the basis of a multivariate statistical strategy involving an analysis of variance, an indexing of the size of effects, and a regression analysis. At the kinematic level, adiabatic trajectories have become manifest, whose underlying state spaces and interrelated metrics are shown to be dependent on the particular text producer. It is made evident that a certain degree of consciousness is carried by a particular kind of concepts and conceptual relations. Finally, it is concluded that perceiving a phenomenon differs not only in degree but in kind from conceiving its consequences.

173. Bierschenk, B. (1996). The measurement of perspective change through textual movement patterns. *Kognitionsvetenskaplig forskning,* No. 59; 0281-9864. (ED 409 555)

Abstract

An entirely new approach to the study of text building behaviour is possible through the application of Scanator. The present article consists of a demonstration of some of its fundamental functions. These are suitable in a study of text building. The basic concepts, expressed through an analysis of a small part of an interview text, derive from a thermodynamic treatment of text building. Through Scanator, a number of qualitatively distinctive phases at the kinetic level of processing are made evident. In a

first phase, text material is transposed and arranged for automatic processing. Constituent of this phase are five components. These are manifest as functional constants and variables of the AaO machine. Processing ends when a matching algorithm has identified graphemes or strings of graphemes that carry their values. A second phase is associated with joining and linking processes. At the kinetic level they provide for the bookkeeping of reversible and irreversible flows. Through channelling of textual elements, supplementary operations fill out all places where textual material is lacking. The second phase terminates when all involved processes have reached their steady states. This implies that a number of points have been diffused over the whole body of the text. In this context, body means more than just an organism. Strings of graphemes give rise to larger functional units through partial qualifications. It is demonstrated how points relate at various distances, pressures and forces. Further, it is shown that points of different kind are separable, when the distance measures reach their critical limit. At this limit, a third phase comes into existence. Processing during this phase concerns the assembling of point into natural groups and the naming of these groups. That verbal flow processes can be specified at the kinematic level suggests that point at tractors can be named. When the curvatures of point attractors lean toward a virtual midpoint it becomes possible to demonstrate their state attractor. A topological invariant is demonstrable, whenever two extracted point attractors meet their state attractor. Finally the results show that a state attractor is the proper constraint of its underlying kinetic processes.

174. Bierschenk, B. (1996). The angle of articulation in textual movement. *Kognitionsvetenskaplig forskning,* No. 60; 0281-9864. (ED 409 556)

Abstract
Natural systems are self-organising and stratify according to the angular articulation of their movements. In particular, movement is relative to the levels that define its behaviour space. As natural phenomenon, text production is self-referential. In generating information, the intention of the producer of a text becomes specified. Specifying of intention is dependent on phase and phase transitions. In agreement with realised phase values, spanning over 360 degrees, co-ordination and co-operation among parts is of significance. Joints and links are channelling textual elements. A mapping procedure is locating the discontinuities by keeping track of changes, flows and rhythms. This is a more elastic and fluid strategy, compared to former approaches. The discontinuities are used in the description of states and state changes across the kinetic and kinematic levels of verbal flow fields. It is shown that novel properties have emerged along the adiabatic paths of the investigated text. This means that attractors of points and attractors of states have manifested informational structures that are more elaborated than the previous studies could show.

175. Bierschenk, B., Bierschenk, I., & Helmersson, H. (1996). Die Ökologie des Sprachraums (The ecology of the language space). In: W. Bos, & C. Tarnai (Eds.), *Computerunterstützte Inhaltsanalyse in den Empirischen Sozialwissenschaften. Theorie - Anwendung - Software (Computer aided content analysis in the empirical social sciences)* (pp. 11-31); 3-89325-414-5.

Abstract
The dominating property of the present report concerns an approach, which is exclusively based on discontinuities as the reliable observations. In what way the

presentation is designed and the main assumptions are formulated is described within an ecological context. Furthermore, a system of computer programs constitutes the background for reflection. A perspective, oriented on the environment, is extricated through effective evolutionary processes, bifurcation, and loss of stability. With the achieved results, it is demonstrated that various context dependent structures and sub-structures have been differentiated and established. Finally, in its dealing with problems of complexity, the significance of the ecological approach has been made evident with the aid of model-oriented and topological expressed references to the well-known "Visual Cliff" experiments.

176. Gabrielsson, Å., & Paulsson, M. (1996). The actor view of nature and strategic change. *Scandinavian Journal of Management, 12* (3), 317-332. (Reference: Citation of Excellence, ANBAR No. 25AX608 in the Database *Top Management Abstracts*, (1996, September, p. 317.). [Original work published in *Kognitionsvetenskaplig forskning,* No. 28; 0281-9864.]

Abstract
Investigates the way in which an individual actor's view of nature can influence local development strategies. Presents case studies of two municipalities in Sweden to assess the impact of two actors (municipal commissioners) on the strategies of local development projects concerning forestry. Describes the methodology, which analyses the interview responses of actors to provide an insight into their conceptual worlds using Bierschenk's novel technique of Perspective Text Analysis. Presents three-dimensional topographical representations of the conceptions of the two actors, discussing the four components of their viewpoints and their perspective. Compares the actors' conceptions of the forest and nature, summarising the key differences in a table; attempts to explain these variations using models developed by Asplund and Frängsmyr. Briefly outlines the local development strategies of the two municipalities, finding a connection between the actors' conceptions, their ideas on future development and the strategies enacted.

177. Bierschenk, B. (1997, November). Stability and change in the development of knowledge. In: E. Lefebvre, & R. Cooper, (Eds.), *Proceedings of the Conference on Uncertainty, Knowledge and Skill (Vol. 1),* Limburgs Universitair Centrum, Faculty of Applied Economic Sciences, Belgium.

Abstract
This contribution is about an entirely new approach to the study of knowledge. As an introductory remark, the classical research operations in the field of cognition are reviewed. Against this background, an application of David Hestenes theory of rotational dynamics is demonstrated with particular reference to text processing. Based on the mechanism of joints and links of the AaO machine, angular displacements and the control of textual movement patterns are topologically presented. In the discussion, it is made evident that the presented approach carries more ecological validity than is reflected through all previous methodological attempts of giving a precise measure of attitude change in the development of text.

178. Bierschenk, B (1997, April). An application of the theory of dynamic rotations to processes of evolution. In B. Bierschenk (Chair), *Content analysis and text processing*. European Symposium conducted at the Department of Business Administration of Lund University, Lund, Sweden.

Abstract
The basic conditions of dynamic rotations to processes of evolution concern the degree of change in the articulation of a variable. The change in the observation of a change in articulation at a certain step means a change in attitude. For example, the process of producing "magnitudes" and to arrangement them in succession requires that a change is determined within and between periods and the intervals of a period. By applying the "Connes-fusion" to this process, folding operations come into existence that unites certain magnitudes. Progressive processing of any magnitude on the distance between the actual state and the equilibrium of a system demands an operator-valued function or a q-numbered measure on the existence of branches of groupoids.

179. Bierschenk, B. (1997). Cycles and oscillations in text processing. *Kognitionsvetenskaplig forskning,* No. 62; 0281-9864. (ED 412 225)

Abstract
The classical research operations in the cognitive sciences concern categorisations as well as classifications, which strongly have been influenced by nomological approaches. As a consequence, information processing has been explained with reference to syntactic-semantic models. Because of an absence of structural implications, personal interpretations have had great impact on the presentation of results of relevance to the cognitive sciences. In contrast, and central to the present article is the concept of "process" and an approach that takes its departure in text building behaviour as well as the oscillations of this behaviour. As a result, morphological profiles have been produced. Characteristic of these profiles is that they manifest time-dependent system states and state attractors. These are the result of an interaction of a perspective and objectives within the AaO paradigm. The discovery of recursive phase singularities constitutes a significant discernment of the involved physical mechanism.

180. Bierschenk, B. (1997). Informational interaction with model-societies of different theoretical orientation. *Kognitionsvetenskaplig forskning,* No. 63; 0281-9864. (ED 430 868)

Abstract
The focus of the study dealt with in the present article is on a longitudinal approach to the perception and judgement of differently founded model-societies. The reported design covers a period of 15 years and is stressing the fact that the participation of apparent dissimilar groups has made possible true experimentation as well as the validation of the approach. Study and analysis concerns the educational program, developed and commercially produced by the Biological Science Curriculum Study of Boulder, CO in co-operation with Crystal Productions of Seattle, CA. This company has produced differently coloured slide series of person-environment interactions that were built on extrapolated trends and tendencies in the USA of the 1970's. At the beginning, experimentation was finally anchored in the theory of ecological

perception. Based on the two established factors, their factor-scores were used in the set-up of two test-vectors, which allowed a location of the model societies in the measurement space in terms of their centroids. In a second step, the approach was extended to encompass the theories of discontinuity. Thus, in contradistinction to common analytical studies fairly extensive analyses of statistics were examined with a concentration on the contribution the Time-factor could make to a topological study. By means of a topological analysis it was possible to detect and abstract transformational invariants in the form of singularities. These could specify (1) the nature of change as well as (2) the identity of the affordance structure of the episodes. Its manifestation in the form of higher-order invariants has made evident that quality in a model society can be equated with perceived certainty in one's possibility of making a living in a particular model-society. On the basis of achieved remodelling transformations, it could be demonstrated that development in the perception of life quality is identical with growth in the standards of living. In contrast to the perception of the organisational layout of the model-societies, this is a perceivable event. The basic structure of citizenship seems to be preserved over changes on the global time dimension. It has been demonstrated that the evolution of quality over the covert periods has changing degrees of certainty with respect to one's possibility to gain in life quality. This means that the estimates of perception of life quality develop in agreement with the shape typical of the S-function. It follows that this development is non-linear. This justifies the topological analysis of "growth".

181. Bierschenk, I (1997, April). Text and context. In B. Bierschenk (Chair), *Content analysis and text processing*. European Symposium on Text processing conducted at the Department of Business Administration of Lund University, Lund, Sweden.

Abstract
A great majority of scientific text analyses is initiated on the basis of the researcher's assumptions of what should be expressed in a certain text within a certain area. In a broad social science perspective there are as many methods of text analyses as there are projects or fields of research, that is, methods with, for example social, psychological, economic and political constraints. This is due to the fact that the researcher or research group develop their own theories of the "structure" of a field. The work is aimed at affirming or, in the single cases, rejecting this structure by the method used. A common name for a lot of such methods is "content analysis". Each content analysis implies some kind of pre-defined classification scheme applied on the text by an analyser with more or less reliable result. The entire coding process is time consuming at least by larger text materials, and once performed it is hard to apply anew, among other things because the analyser during processing quite simply is not able to keep in mind the classifications made at an earlier stage. It is even more difficult to perfectly agree with another analyser. Consequently, to this methodology is connected a stock of reliability tests, which make the result a question of probabilities, in the statistical sense. Since the 70's and for several years I worked with great amounts of interview materials (4000 pages), consisting of answers to unbound questions (Bierschenk & Bierschenk (1976)). I know what it means to develop coding rules and write a manual and have all the rules and decisions tested for reliability between coders (I. Bierschenk, 1977). With this experiential background I would like to state that the final result of all this is the personal feeling of having learnt a lot about text production and layout and about different processes involved in the various steps

of analysis. But it became more and more difficult to see how this layout or "textual face" could be capable of reflecting something internal, that is, "structure".

182. Bierschenk, I. (1997). Discovery of competence at the edge of literature and society. *Kognitionsvetenskaplig forskning,* No. 64; 0281-9864. [The research of this article was presented at the First International Conference on Quality of Life in Cities, 1998, March, Singapore.] (ED 460 955)

Abstract
This article presents a competence-oriented experiment on the comprehension of ideas in modern literature. Comprehension is defined as being indicative of competence as distinct from qualification. 117 students from various educational programs in a Swedish gymnasium participated in a course on modern literature and society. In the process of testing, the students were at two occasions exposed to three videotaped projections of model societies. In this connection they responded to 15 propositional statements on the quality of life in the projected societies. The instrument measures competence of civilisation by two factors, (FI) Eigenvalue and (FII) visibility of social texture. The model societies represent three dimensions of ideas connected to three scientific paradigms, namely affinity, structure, and process. These dimensions were related and discussed in correspondence with the literary and cultural concepts of behaviourism, structuralism, and functionalism. Before the participants' second exposure to the videos they were given a recognition test in which they were asked to react to 15 items each one describing an idea in function. According to the analysis of variance there is a significant difference in degree of difficulty in the ideas but no difference at all between the classes. The degrees of difficulty have been used to establish a super-ordinal evolutionary scale, which measures comprehension of ideas linked to the cultural dimensions of society. The values on the competence factors (FI, FII) were filtered through the values on the literary scale. Thereby those dimensions of the model societies that describe degrees of competence needs became apparent. Thus, it has been shown that literature is a necessary instrument for perceiving the disparity of a society and for developing competence, provided that its basic idea is transparent.

183. Bierschenk, I. (1997, November). At the edge of uncertainty in language. In: E. Lefebvre, & R. Cooper, (Eds.), *Proceedings of the Conference on Uncertainty, Knowledge and Skill (Vol. 1),* Limburgs Universitair Centrum, Faculty of Applied Economic Sciences, Belgium.

Abstract
This article presents the prerequisites and implications of a new method called Perspective Text Analysis. The discussion concerns some basic differences in social science and linguistic approaches to language modelling and its consequences. The concepts of organisation and structure are contrasted and it is shown and explained the reason why these concepts are mixed up in models of language and texts. In the model presented, text is conceptualised as an exact depiction of the continuous and irreversible flow of information coming into and going out of an agent's sight. The agent as biological phenomenon is the fundamental property of the model, which frees the researcher from dealing with artificial concepts, constructivism, and conventionalism. A biologically rooted mechanism for text production is presented, which operates at the cutting edge of organisation and structure.

184. Elstrup Rasmussen, O. (1997, November). Modelling knowing systems. In: E. Lefebvre, & R. Cooper, (Eds.), *Proceedings of the Conference on Uncertainty, Knowledge and Skill (Vol. 1),* Limburgs Universitair Centrum, Faculty of Applied Economic Sciences, Belgium.

Abstract

The paradigm [int(A) a ort(O)], which expresses an intentional oriented activity coupling of the agent and objective, forms the basis of the modelling of knowing systems. The paradigm forms the unit of analysis. It is proposed that: a) the paradigmatically determined agent-objective system encompasses the activity states of identifying, integrating and positioning; b) the agent-objective system is self-referential; c) the functional self-reference (Aa(AaO)) gives rise to mental events which implicate recurring time; and d) the agent-objective system is self-organising through a self-writing/self-reading process which establishes ecological flow stability (Fließgleichgewicht). Utilising the propositions, a three-level model of a knowing system is constructed. The fist level encompasses an ability cycle utilising known ideas, by means of which flow stability is established in uncomplicated known surroundings. The second level encompasses a qualification cycle restructuring existing knowledge, by means of which flow stability is ensured in a known, but complex ecology. The third level encompasses a competence cycle generating new knowledge, by means of which flow stability is established in complex unknown surroundings.

185. Elstrup Rasmussen, O. (1997). Co-ordinating co-operation in complex information flows: A theoretical analysis and empirical description of competence-determined leadership. *Kognitionsvetenskaplig forskning,* No. 61; 0281-9864. (ED 410 526)

Abstract

Scanator provides the basis for this work. Scanator is a modern, ecological psy-chophysics encompassing a cohesive set of theories and methods for the study of mental functions. Within the framework of Scanator we can study *competence,* i.e. the capacity for making sense in complex situations. Scanator does not, however, include a functional model to explain how various forms of sense making are co-operatively co-ordinated. This thesis develops such a model, which forms a theoretical expression of the phenomenon of leadership. The essential reasoning underlying this work with the theoretical modelling is the idea that organising principles, and co-ordinating co-operation in particular, which are known at the biological level, can be transformed invariably to the psychological level in such a way as to make the phenomenon of leadership intelligible. The basic theoretical work is thus aimed at transforming a biological frame of reference to a psychological one in such a way that a set of organising principles can be maintained through the transformation process. The primary organising principle that is transformed can be described as an information-guided self-writing/self-reading process. It is demonstrated that this natural principle at the psychological level has the paradigmatic form: (int(A)) a (ort(O)) representing an intentional (int) oriented (ort) coupling of activity (a) between an agent (A) and an objective (O) (B. Bierschenk, 1984). By means of the (AaO)-mechanism, i.e. production of natural language, mental systems make the unknown known, that is, make sense. This specific form of organisation is designated as competence. The mental expression of competence, the holophor, can by means of Scanator be

described topologically as a cohesive set of stable attractors which encompass information in the form of ideas. And it is the co-ordination of the holophors created through competence which forms the basis for understanding the concept of leadership. The idea behind the concept of leadership is linked to the organising principle which implies that two auto-oscillating systems, when linked up, will function as one virtual system. The co-ordination process itself, i.e. co-ordinating co-operation, is analysed as an innovative searching process, which aims at establishing a stable state: the super-holophor, which will satisfy both auto-oscillating systems, which are necessarily altered by the same process. On the basis of the theory created, a series of hypotheses are postulated concerning the functional nature of leadership. The concept of leadership, as established in the present work, differs from mainstream concepts of leadership by being grounded in theory and operational, and can thus serve as the frame of reference for experiments. To contextualise the concept of leadership, a small-scale empirical investigation of co-operation between two students is undertaken. Prior to the commencement of their co-operation, the two students were asked to describe their expectations of the co-operation, which they were subsequently similarly asked to describe. The empirical investigation supports the theory postulated, as it can be demonstrated that the expectation holophor of one student is embedded in the co-operation holophor of the other, and vice versa. A distinct overlap is produced, which is exactly what should occur in the event that the two mental systems have been embedded in a co-ordinating co-operation.

186. Trosslöv Aronsson, A. (1997). *Consumer interpretations of idealised images in advertisements*. 14:e Nordiska företagsekonomiska ämneskonferensen, [14th Nordic Conference in Business Administration], Bodö, Norway.

Abstract
Images in advertisements are sometimes idealised. They represent highly desirable physical characteristics, personal attributes, and social circumstances that can be achieved by only a few people. In this study, the slender female body that represents a beauty ideal currently in vogue is regarded as one type of idealised image. Idealized images are surrounded by a paradox: they attract people and draw their attention, but they also may create dissatisfaction and unhappiness. People may become discontented with their own circumstances and disapproving of who they are because they cannot achieve the ideal represented. Therefore, idealized images in advertisements represent interesting phenomena to research because of what they reveal about how people respond to these advertisements. In this paper, consumer interpretations of idealized images in advertisements are discussed. The empirical data were collected through a projective technique. Female consumers wrote short stories about "how you think people would perceive the advertisement in which you are a model". Perspective Text Analysis (PTA) has been used to analyse the stories. Through PTA, the structural relations within the texts are uncovered and synthesized. The findings from the study indicate, on one hand, that the advertised image is not only perceived as idealized, but as a sacred image, a divine icon; on the other hand, the image is viewed as manipulative.

187. Bierschenk, B. (1998, March). Perception and judgement of life quality across projected societies. *Proceedings of the First International Conference on Quality of Life in Cities – Issues and Perspectives* (Vol. 1, pp. 17-24), Singapore; 981-04-0126-4.

Abstract

The focus of the presentation is on the individual's comprehension of "citizenship". Study and analysis of citizenship concerns a person's co-operative interaction with various physical and social surroundings as well as the cognitive integration of these surroundings. A person can achieve this integration through development of his abilities of judgement. Thus the aim is to make apparent the kinds of judgement that have been manifested on the basis of three different sequences of episodes modelling modern live and citizenship. These sequences refer to "Projections for the Future", which is an audio-visual slide series that has been produced commercially by the Biological Science Curriculum Study of Boulder, CO in co-operation with Crystal Productions of Seattle, CA. This company has produced differently coloured slide series of individual-environment interactions that were built on extrapolated trends and tendencies in the USA of the 197's. These projections have been studied scientifically in the Swedish as well as in the Danish Societal context.

188. Bierschenk, B., & Marker, B. (1998, March). Competence as a prerequisite for the attainment of life quality. *Proceedings of the First International Conference on Quality of Life in Cities – Issues and Perspectives* (Vol. 1, pp. 25-32), Singapore; 981-04-0126-4.

Abstract

This paper describes differences between the capacity of Swedish and Danish students to attain life quality. This was carried out by examining the level of competence in four different groups of Swedish and Danish students, and is based on the hypothesis that the possession of competence is a premise for the development of life quality. *Competence* means the ability to make sense in complex situations; more concretely it is the quality on the basis of which the individual activates his or her knowledge base and co-ordinates his or her actions. This definition implies that competence is a synthesis of perception and action, both of which can be detected and studied. The test method used in the present experiment involves the individual's perception of information, adaptation and preference between three different model societies, projected via series of slides. An account will be given of the individual's ability to pay attention to the phenomenon of self-recognition within these societies. The paper demonstrates that purposeful adaptation and preference in judgement give certain clues to the mental states of the participating students. The result of the examination was remarkable. For the first time in twenty years of using the same test method, the scores of a participating group vary considerably from the norms. Values that normally turn out positive were instead negative. The experiment reveals that a sample of Danish students was incapable of distinguishing between different used models in the test material. At the present time according to our test method they are incompetent.

189. Bierschenk, B. (1998). A topometric approach to life quality across comparted time and projected societies. *Kognitionsvetenskaplig forskning,* No. 65; 0281-9864. (ED 418 998)

Abstract

To explain how the Swedish citizen has developed his judgement concerning life quality, attributable to real and simulated civilisations is the aim of the present study.

It builds on a research report about three model-societies that have been studied with the assumptions that (1) competition implies selection, (2) selection implies independence and (3) independence implies success. In the present article it is shown that "certainty in preferential judgement" constitutes a behavioural expression of survival competence. With a focus on the demonstrative definition of competence as development at the edge of competition and success, the present study has generated two topographic ally derived scales. One is a time scale (T') that is local and measures ecological variation. The other is a time scale (r) that is global and measures evolution.

190. Bierschenk, B. (1998). The basic conditions of life: An ecological approach to perceptual sensitivity of Swedish and Danish students. *Kognitionsvetenskaplig forskning,* No. 67; 0281-9864.

Abstract

The present paper takes up the problem of civilian development in Sweden and Denmark and its relation to some prototypical societies. By means of a simulation experiment, it is demonstrated that the perceptual sensitivity of Swedish and Danish students at upper secondary school level varies systematically concerning the basic conditions for "personal growth". Further, an attempt is made to constrain this concept contextually, in such a way that it can be described behaviourally. It is made evident that Swedish students are certain that only a society, founded on the principles of behaviour modification can provide the conditions for their personal growth. In contrast, Danish students have demonstrated a higher degree of differential sensitivity to contextual variations. Consequently, for them, a society that is building on behaviouristic principles accommodates significantly different conditions for personal growth compared to a society that builds on the principles of structure. But the latter is also perceived to provide significantly different conditions compared to a society, building on process principles. Moreover, all three prototypical societies are discerned to have significantly less favourable conditions for the development of Life Quality (LQ) compared to the conditions of the Danish society. However, with respect to its surface conditions, the latter is determined to be highly similar to the social texture of the prototypical society, which is obeying the principles of the process paradigm.

191. Bierschenk, B., & Yuen, B. (1998). Competition-success interaction as governing mechanism for competence development. *Kognitionsvetenskaplig forskning*, No. 68; 0281-9864. (Psycnet.apa.org/psycinfo/1998-10940-001)

Abstract

The present study concerns the way in which its participants have picked up and cognitively integrated information on various models of possible societal development. The study draws attention to a perceiver's potential of co-ordinating his views of the consequences of behaviour with behavioural control. Accordingly, the participants have been asked to prospect the consequences possible in a given environment and report their judgements in two different ways. One concerns the measurement of Eigenvalue. Consequently, it may be expected that attitudes and beliefs about one-self are introducing more about cultural and economic differences than is suggested by projected cultural values and socialisation practices. The other concerns a filter effect that might be expected to work on the societal endowment of behavioural tendencies and integrate possible differentiation and separation by means of cultural layers, which constitute its shape becoming visible in the form of social

texture. Both factors relate the participant's perceptual sensitivity and adequate judgement to novel sequences of events. In confronting different students with different types of civilisation in different environments it has been possible to demonstrate that competitiveness is the major source of variation in the development of Eigenvalue.

192. Bierschenk, I. (1998, March). Effectiveness of literature study in discriminative interaction with projected societies. *Proceedings of the First International Conference on Quality of Life in Cities – Issues and Perspectives* (Vol. 1, pp. 33-43), Singapore; 981-04-0126-4. [Transformed from article published 1997 in *Kognitionsvetenskaplig forskning*, No. 64; 0281-9864.]

Abstract
The present contribution is intended to give an account of the reactions of 19 years old students of a Swedish Gymnasium to some 20th century ideas and their social implementation. The students were exposed to three potential developments of future societies and thereafter an extended course on modern literature took place. All participating students, in all 90 subjects, were re-tested on the same three videotape societies. The purpose with his test-retest design was to study the possible impact of literature dimensions that correspond with the scientific paradigms of (1) affinity, (2) structure, and (3) process, which are built into the video-projections in the form of situations. The dimensions chosen and discussed with the subjects were (1) surrealism / behaviourism, (2) expressionism / structuralism, and (3) futurism / functionalism. These concepts were made concrete by studies of works of European and US authors and poets as prototypical representatives. The study took place within the ordinary lectures during spring term 1997. The time schedule for the course contained 15 hours of lecturing. It ended with a test in which the subjects were asked to read a set of texts constructed as situations giving a cue to a modernistic concept. As answers they had to indicate the name of a prototypical author. The scientific question to be studied is whether or not literature study of modern ideas is contributing to one's comprehension of modern society. There is an indication that the conception of the model societies is non-changing and that the conception of one's native society becomes more profiled. However, differences have been noted with respect to the surface and depth dimensions of a society. Moreover, individual differences seem to depend on one's educational profile.

193. Bierschenk, I. (1998). Civil depth perception: An experiment in competence development. *Kognitionsvetenskaplig forskning,* No. 66; 0281-9864. (ED 460 956)

Abstract
This article focuses on the perception of the surface and deep dimensions of a society and its relation to competence. 117 students from various educational programs in a Swedish gymnasium participated in an experiment in which they were at two occasions exposed to video taped projections of model societies. They responded to 15 statements marking the degree of certainty with which they perceived quality of life in these societies. The instrument measures Life Quality (LQ) in a certain civilisation by two factors, Eigenvalue (FI), and Visibility of Social Texture (FII). The model societies are based on three modes of modelling man interacting with his society, specifically on the concepts of (1) behaviourism, (2) structuralism, and (3) process. The function of these concepts has been to specify the actual society, namely Sweden.

It is assumed that Sweden is familiar to the participants but conceptually unknown. Between the two occasions of video exposures the students were given a nine weeks course in modern ideas and concepts, especially those, which have been made dependent on 20[th-] century novels and which connect to the three models. The certainty, with which the students perceive Eigenvalue and its conservation in Social Texture in the four societies, differs significantly from the first to the second occasion. The first time, the only society that meets the requirements is the society based on behaviour modification, while the other three seem unspecified to all the students. The second time a dramatic change takes place in that, firstly, Sweden now is assessed with highest certainty, and, secondly it gets its conceptual specification mainly by the behaviourist model. Thus the study has shown that the students have augmented their conceptual understanding of the dimensionality of a society and have come to "know" the society they live in.

194. Elstrup Rasmussen, O. (1998). Putting quality of life to the test. *Proceedings of the First International Conference on Quality of Life in Cities – Issues and Perspectives* (Vol. 1, pp. 97-108), Singapore*;* 981-04-0126-4.

Abstract
Quality of life encompasses living conditions like clean air, transportation, and civil rights, but, most of all, quality of life is a personal experience, i.e., a mental state. Mental states are expressed and generated in psycho-biological systems which encompass ecology and environment. In this presentation a psychobiological system is defined as irreversible time dependent interactions between ecological structure and environmental texture. The ecological structure encompasses three different but coherent mental processes: ability, which is knowledge modification in known situations, qualification, which is knowledge alteration in known situations and competence, which is knowledge innovation in unknown situations. However, any ecological structure is exposed to an environmental texture. The most fundamental environmental texture is composed of the relation between the two degrees of freedom: competition and independence. The interaction between the ecological structure and environmental texture is that of ecological survival strategies: the affinity, the Gestalt, and the cybernetic, on which selection operates.

195. Bierschenk, B (1999, March). *Competence – New perspectives on the extraction of informational invariants: Some examples from national and international industry*. Workshop 9, Human resources in work life. Symposium conducted at the Meeting of the Danish Research Councils, Roskilde, Denmark.

Abstract
Enterprising in dialogue with reality implies that a company must act in order to organize itself in agreement with some contextual reality. Therefore, a successful company has to develop a knowledge base and skills for various kinds of environmental analyses, which has to be conceived as a self-evident requirement. As time goes by, very often this capacity will have reached a developmental level, which widens the gap between internal refinements and environmental reality in a way that is difficult to bridge with classical methodological approaches. In order to visualise an employee's knowing and to make the application of a perspective accessible in the context of international research, it is necessary to make the emerging knowing topologically evident. Since holophors constitute the framework for topological

invariants and the description of attractor landscapes, they are the means for alternative descriptions of knowability. Finally, the envisioned research activities are aimed at potential specifications of what "knowing" implies at various levels both nationally and internationally.

196. Bierschenk, I (1999, March). *Kompetensutveckling bortom målstyrda "hit"- och "miss"-mekanismer (Competence Development beyond goal-directed "hit"- and "miss"-mechanisms)*. Workshop 9, Human resources in work life. Symposium conducted at the Meeting of the Danish Research Councils, Roskilde, Denmark.

Abstract
Today competence development is the notion of fashions in schools as well as in various societal institutions and business companies. Competence development is also strictly coupled with quality and quality rising attempts. It is assumed that that the quality of a product is dependent on the quality in the production process. In turn this condition is dependent on the behavioural quality of the person, who performs the action or implements a strategy of actions. The determination of the degree of difficulty in a task has important implications for instruction and attempts to develop competence. In conclusion the instructor's competence encompasses his ability to select the material properly adapted to the level of the student and to guide him from one level to the next. That is, transparency in conceptual relations is minimizing the risk of misses and misunderstanding as well as discontent since the student has no-one to blame when competence is defined by the material and not be the teacher.

197. Bierschenk, I. (1999). Textens essens: En dialog om Perspektivisk Textanalys. *Kognitionsvetenskaplig forskning,* No. 69; 0281-9864.

Abstract
The present chapter is written mainly as a tutorial for those researchers who try to get out something essential from peoples' way of reasoning and behaving and who suppose that this is expressed in their spoken and written language. Fundamental to the method presented here is that it gives a synthesis of the perspective that a text producer gives to a text in the moment of its evolvement. Since a perspective cannot be developed within single clauses and sentences but in the co-operation between them, linguistic data in the form of free text production is important. The very first ideas about the possibility of analysing text against the background of the intention within a text producer were born by the middle of the 70's. The baselines of the method Perspective Text Analysis (PTA) were drawn during the beginning of the 1980's. Since then the theoretical assumptions have deepened along with innumerable empirical experiments, and so the methodological prerequisites have changed from the broad social science perspective toward a linguistic and psychological one concerning methodology to finally end up at the bio-kinematical level. In the present guide the fundamentals of the method are described and therefore the principles of text analysis are presented by prototypical examples. Because of the new theory put forward, this chapter has been given the form of a dialogue. For the same reason, there are no references in the text. The reader is referred to the list of relevant works at the end of chapter.

198. Bierschenk, I. (1999). The essence of text: A dialogue on Perspective Text Analysis. *Kognitionsvetenskaplig forskning,* No. 70; 0281-9864. (ED 430 053) [Original published in *Kognitionsvetenskaplig forskning*, No. 69; 0281-9864.]

199. Bierschenk, I. (1999). Tekstens essens: En dialog om Perspektivisk Tekstanalyse. *Kognitionsvetenskaplig forskning,* No. 71; 0281-9864. [Original work published in *Kognitionsvetenskaplig forskning*, No. 69; 0281-9864 and translated by M. Poulsen, & O. Elstrup Rasmussen, 1999.]

200. Bierschenk, I. (1999). Materials-directedness as educational method. In I. Bierschenk, The emergence of competence in the breakdown of goal-directed education. *Kognitionsvetenskaplig forskning,* No. 73 (a); 0281-9864.

Abstract

This is the second article on the competence theme, which aims at demonstrating the consequences of a new educational paradigm, namely materials-directedness. By this is meant the conceptual control of the built-in disparity of educational materials. By means of a new method for structural analysis (in a biological sense), it is shown how conceptual relations and dimensions of a literary text are laid bare. The demonstration text, which is a description of the idea of behaviourism, is analysed and discussed with respect to the underlying structural relations. It is pointed out that text materials, such as novels, may be characterised by difference in conceptual depth and that competence is a matter of conceiving this predefined character. In such a way the teacher would be freed from stating preferences about texts, because the levels of aspiration put in the material.

201. Bierschenk, I. (1999). Thirst for learning - a myth. In I. Bierschenk, The emergence of competence in the breakdown of goal-directed education. *Kognitionsvetenskaplig forskning,* No. 73 (b); 0281-9864.

Abstract

This article is a discussion of the possibility of changing the view of knowledge producing activities toward a competence directed education. After presentation of the traditional behaviouristic model and its consequences when applied on teaching, a new concept of competence is suggested, which differs from the concept of qualification. An important part of the article deals with the evaluation as an idea and a method for quality control. It is shown that evaluation of teacher effectiveness is of no use, since it functions as a means of bonding teacher and student, which is highly ineffective for measuring mental growth and indeed highly undue for use in school situations. Finally, a new system component is introduced, that is competence should be directed and regulated by the teaching material instead of being goal-directed.

6. Period: 2000-2009

6.1 Introductory Remarks

The sources for validating energy landscapes are studies, which are carried out with the purpose to explain "spacetime" structures in the context of "information laws". The main hypothesis, which has governed the studies of the present period, is founded on the assumption that bio-kinetic energy at the psychological level becomes changed through the processes of reading and writing. The supposition implies that invariants acquire their characterising properties through bio-kinematic transformations. Since the Agent-action-Objective (AaO) axiom offers a basis for the depiction of the invariants of reading and writing, it has been crucial for the specification of the operating transformations to establish a link between "direct information pickup" in the Gibsonian sense and a produced "style".

The set-up of a validation experiment has been advanced on the bio-kinetic hypothesis that the complexity of a style and the non-linear dynamics of language can be approached through rotating [AaO] units. The experimental results of the validation have shown that the derived rotations are including functions that can be imaged in real time. On the basis of the rigorous experimental set-up, it is demonstrated that a system of [AaO] units has the capacity to keep track of rotations and to validate the evolutionary development of "uniqueness in style", whose paths can be made evident through a search in complex landscapes, which are temporarily fitting into the structures, that have been developed for a particular task.

For example, among educators at all levels there is an awareness, that teaching strategies should aim at developing students' ability to function adequately in known and unknown situations, which requires synthesis. However, in testing a presupposed ability, the tasks are mostly of the analytical kind. Synthesis is connected with structure, which implies that the development of synthesis can only be studied through the structure of text production. People are variably sensible to the structure of educational materials. Therefore, a teaching strategy should aim at catching this variability and training students' sensibility to various structures.

Therefore, the papers of the present period concern validation studies in which students, classified according to high and low analytical performance, were given a reading and text production test to examine their sensibility to structure. The hypothesis tested is whether the structure mediated through the produced texts pertains to a descriptive dimension (analytic sensibility) or to a reflective dimension (synthetic sensibility). The contributions are demonstrating the extent to which a certain learning strategy may be governing in the pick-up and production of structure.

202. Bang, J., & Elstrup Rasmussen, O. (2000). Competence development: Learning by problem solving. *Kognitionsvetenskaplig forskning,* No. 74; 0281-9864. (ED 449 188)

Abstract
On the basis of a dialogue between two students engaged in solving a problem, it is argued that the students differ in their problem-solving capabilities, that is, they reduce the complexity of the situation in different ways. It is also argued that the students do not exhibit the same form of competence. In other words, they make sense of the complex situation in different ways. Further, it is maintained that existing theories are able to explain different aspects of the problem-solving process, and by that competence. However, no single theory encompasses all the aspects. Therefore, a more comprehensive theory is proposed. This theory encompasses the notion that the person by means of ideas is able to consider and anticipate problem-solving operations, and in doing so, the person is in control of the problem-solving process, that is, displays competence. More precisely, the person is in control by means of four processes: efficacy, which is the degree to which the person experiences the feeling of control and of the problem-solving process itself; achievement, which is the degree to which the person experiences that he or she is approaching the goal; ruggedness, which is the degree of difficulty the person feels he or she has to overcome in order to solve the problem; and finally availability, which is the degree to which the person feels he or she has access to vital resources. Using this frame of reference, an interpretation of the two students' problem-solving process is carried out. Finally, it is suggested that it is possible to apply catastrophe theory in order to make a model of problem-solving behaviour.

203. Bierschenk, B (2000, October). Nature's string stitching device for the production of a language space. Poster session presented at the *9th Herbstakademie on self-organisation of cognition and applications to psychology*, Conference on Dynamical Systems in Cognitive Science, Ascona, Monte Veritá, Switzerland. [The result of this work is presented in *Kognitionsvetenskaplig forskning,* No. 80; 0281-9864.]

Abstract
No one has ever been able to look into the language space nor has anyone been able to measure the phenomenon of consciousness without the interference of an observer. This article is changing this situation completely. From now on it is possible to produce measures of consciousness without the presence of classical observation devices. In particular, the observation problem can be bypassed since the "observer" is part of the "observed". This means that the phenomenon is describing itself. Since there is no longer any need for mirroring the state of consciousness by the state of an apparatus, the classical problem of an observation on the apparatus has disappeared. It is shown that the measurement situation has been changed fundamentally. A full description is attainable through the establishment of the geometrical shapes of involuted textual flows.

204. Bierschenk, B. (2000, November). *The production of textual pattern dynamics as a function of self-organisation in cognitive processing.* Meeting conducted by N. Caramelli at the University of Bologna, Bologna, Italy.

Abstract
The basic focus will be on textual pattern dynamics as outcome of a subtle interplay between intentionality and orientation, for which the Agent-action-Objective (AaO) axiom provides the proper foundation. Conceived of as systems, it will be shown that the AaO carries intentional cues and contains information about the produced orientation in the pattern dynamics. In particular, it will be made evident that the AaO-systems are embedding structurally the text producer's point of observation as well as his points of view. As a result, this condition will make it possible to demonstrate dynamical text building behaviour through the discovered AaO-mechanism and to extract directedness and orientation in the identified movement patterns. And particularly, it is this dynamic behaviour in the AaO that will provide the basis for a thermodynamic description of the mind, i.e., what is implied by a theory or enclosed through the links of a constructed model.

205. Bierschenk, I (2000, October). The correspondence between an evolving mental space and text production. Poster session presented at the *9th Herbstakademie on self-organisation of cognition and applications to psychology*, Conference on Dynamical Systems in Cognitive Science, Ascona, Monte Veritá, Switzerland.

Abstract
A main line of thought in modernistic prose concerns the efforts of transforming scientific concepts into literary forms. This paper presents a study, which formulates the hypothesis that, despite these efforts, a clear distinction should be found between the theory and mind of an author and his text producing practice. A text sample from a well-known American Nobel Prize holder has been studied by means of Perspective Text Analysis, by which the space of a text can be established and measured. Contrary to the hypothesis, the result shows a perfect consistency between mind and practice in the sense that this author is proved to be a functionalist throughout. The functionalist text designer has produced a behaviouristic textual surface, that is, the perfect experiment put into practice.

206. Bierschenk, I. (2000). Do the humanities contribute to education? *Kognitionsvetenskaplig forskning,* No. 75; 0281-9864. (ED 449 189)

Abstract
The focus of this article is on the question whether pure literature can contribute to education. As a portion of modern literature study in Swedish upper secondary level, novels about the future were examined, especially some, which take a critical position toward modern civilisation. In an experiment using Perspective Text Analysis, a master text has shown the theoretically rooted dimensionality of 'futurism' as a socially valid concept. 18 year-olds got the task to write about a novel by using concepts taken from the master structure, of which 'public morality' was selected for the analysis. The hypothesis tested was that a novel writer contributes to the edification of a public only if he/she translates some structural dimension in an ongoing civilisation process. To this translation belongs a sense of public morality. The study concludes that when the students' responses were matched against the master structure, only one novel meets the criterion of being educative with respect to futurism. It is Huxley's Brave New World, which contributes to education by mediating an ideology behind a civilisation process with a sense of morality.

207. Bierschenk, I. (2000). Testing for competence. *Kognitionsvetenskaplig forskning,* No. 76; 0281-9864. (ED 449 190)

Abstract
The aim of this article is to make a distinction between qualification and competence. Although academic institutions, organisations, companies, and schools are focussing upon competence development as the natural answer to new technical and societal demands, no one has succeeded in providing a satisfactory operational definition of 'competence'. A dictionary search has shown that different areas of science and humanities conceive of competence from an analytical point of view, which, in fact, relates to the word 'qualification'. However, the Latin word *com-petens* comprises properties of intentionality, which adds not only a dynamic but also an individual component to the concept. This is the starting-point for a study, in which a student's competence has been examined by means of Perspective Text Analysis, which is an entirely new method for making visible the structural relations of texts. In this study, a teacher of Swedish language and literature at upper secondary level makes visible for himself a conceptual structure, which will serve as a steering instrument for literature study in class and also as criteria for assessing and grading. He tests a student, who has not so far proved to qualify for passing the course, and is able to show that this student has produced a similar structure as the one, which served as a criterion. The study concludes that by this method it is possible to identify students' competence, which may be deep enough for scoring high on a test despite insufficient qualifications. Competence is to be found beyond qualifications, and a grading system, which aims at taking into account every single person's ability, would profit from this new approach.

208. Elstrup Rasmussen, O., & Jensen, J. A. (2000). Preparations for modelling the relationship between competence and qualifications. *Kognitionsvetenskaplig forskning,* No. 77; 0281-9864. (ED 449 188)

Abstract
This report includes a presentation of basic theoretical and methodological assumptions for investigating the relationship between competence and qualifications by means of simulation tasks. An analysis of the types of tasks that have been used in the study of problem solving psychology serves as a background for an exposition of the relationship between competence and qualifications. The vehicle for investigating competence and qualification is the INTOPIA program, which involves a task that simulates entrepreneurial enterprise. Findings are reported from a pilot experiment, the aim of which was to examine the feasibility of adapting the program for use in research. In particular, the findings indicate that the number of sessions needs to be reduced considerably form the amount used in the teaching situation for which it was originally developed. Finally, the issues for investigation in a forthcoming experiment and the tool to be used for modeling the behaviour of the subjects are outlined.

209. Bierschenk, B (2001, May). *Transformation of a word model to a numeric structure.* Paper presented at the Meeting of the Swedish Group of Cognitive Psychology, University of Växjö, Växjö, Sweden.

Abstract

This paper presents an invariant formulation and analysis of the Agent-action-Objective (AaO) kinematics in terms of David Hestenes theory of rotational dynamics. Accordingly, the term invariant refers to a coordinate-free establishment of structure. Its major aim is to make evident that Natural Language employs its own intrinsic systems of coordinates, but these are generally unknown. In particular, the presented results give weight to the hypothesis that rotational dynamics is basic to the effects that selective textual movement patterns have on the evolution of text. In particular, the paper is focusing on the application of rotational dynamics and on a geometric description of text building behaviour. In adopting some basic concepts of Hestenes theory of invariant body kinematics, textual movement patterns have been studied in the form of an English text example. A scalar component is introduced in the form of radians. These are corresponding to the rotations in the A- as well as in the O-component of the established AaO-mechanism. Three more coefficients relate to the "spinors" that are specifying the unique orientation of a particular rotation. It is shown that direction and the rotational angle carry more ecological validity than can be reflected through all methodological distinctions of the classical approaches to the measurement and representation of systems. In contrast, the presented method gives a precise measure of "attitude" change in the evolutionary development of text.

210. Bierschenk, B. (2001). Invariant formulation of the kinematics of body movement on the visual cliff. *Kognitionsvetenskaplig forskning,* No. 80; 0281-9864. (ED 458 229) [Presented as 'Nature's string stitching device for the production of a language space', in a poster session at the *9th Herbstakademie on self-organisation of cognition and applications to psychology*, Conference on Dynamical Systems in Cognitive Science, Ascona, Monte Veritá, Switzerland.]

Abstract

No one has ever been able to look into the language space nor has anyone been able to measure the phenomenon of consciousness without the interference of an observer. This article is changing this situation completely. From now on it is possible to produce measures of consciousness without the presence of classical observation devices. In particular, the observation problem can be bypassed since the "observer" is part of the "observed". This means that the phenomenon is describing itself. Since there is no longer any need for mirroring the state of consciousness by the state of the apparatus, the classical problem of an observation on the apparatus has disappeared. It is shown that the measurement situation has been changed fundamentally. A full description is attainable through the establishment of the geometric shapes of involuted textual flows.

211. Bierschenk, B. (2001). Geometric foundation and quantification of the flow in a verbal expression. *Kognitionsvetenskaplig forskning,* No. 81; 0281-9864. (ED 459 193)

Abstract

This article presents the geometric foundation and quantification of the Agent-action-Objective (AaO) kinematics. The meaningfulness of studying the flows in verbal expressions through splitting and splicing the strings in a verbal flow relates to the fact that free parameters are not needed, since it is not required that the presented methodological development fits one or the other empirical context. The major aim is to make evident that natural language employs its own intrinsic system of coordinates.

These coordinate systems are transforming kinetic energy into discoverable verbal flows. It is demonstrated that language must be conceived of as a natural system that becomes structured through rhythmic driving forces. In particular, the presented results give weight to the hypothesis that rotational dynamics is basic to the effects that selective textual movement patterns have on the evolution of texture, i.e. a text surface. Since the experimental procedure has been focused on the manipulation of text translation, asymmetries, and phase transition, it has been possible to show that the translators meet the same functional requirements in different ways, but are producing multiply stable trajectories of similar kind. The studied text example shows that the dynamics, induced through translations, is producing a deeply ingrained commonalty. Relative phase stability in the developing strands has revealed that the mechanism is generating symmetries. Since the symmetries are the consequences of processing, apparent contour similarity has important theoretical implications.

212. Bierschenk, I. (2001). From science to fiction: Measurement and representation of an idea. *Kognitionsvetenskaplig forskning,* No. 78; 0281-9864. (ED 452 222) [Part of this work was presented in a paper on *'Self-reference in writing'* at a Meeting, conducted by N. Caramelli at the University of Bologna, 2000, November, Bologna, Italy.]

Abstract
A main line of thought in modernistic prose concerns the authors' efforts of transforming scientific concepts into literary forms. Two scientific ideas can be discerned in 20th Century thinking, the structuralism in Europe and the functionalism in the USA. This paper presents two experiments. One discusses the behaviouristic writing style of Ernest Hemingway and formulates the hypothesis that, since he is a behaviourist in practice then he should be a functionalist in mind. The basis for this hypothesis is the functionalistic Visual Cliff-experiment, in which a device was built up for testing depth perception with the use of a behaviour component. A text sample from a short story from 1927, "The Killers", has been studied by means of Perspective Text Analysis. The result has shown a perfect consistency between mind and practice in the sense that Hemingway is proved to be a functionalist throughout. The second experiment concerns the test of a test item. It is supposed to be a description of the idea of functionalism but it has proved to be difficult for students to discern this item from an item describing behaviourism. By the use of the same method it could be shown that the item is a true representative of functionalism in that its functional component is transparent through the behavioural. It is concluded that the result of the two experiments is an invariant structure of the idea of functionalism.

213. Bierschenk, I. (2001). Development of competence in dynamic learning environments. *Kognitionsvetenskaplig forskning,* No. 79; 0281-9864. (ED 452 240)

Abstract
In information rich societies like ours there is a demand for a steadily ongoing discussion and research of the way people in various functions develop and maintain their competence. Competence has become a word of fashion and although everybody thinks that they know what competence is, nobody can tell how it may be measured. The traditional definitions of the word rest on properties, which are equal to knowledge and qualifications. Therefore, when it comes to a measuring procedure,

intelligence tests or questionnaires will most often be used, which cannot get at the strategy of synthesising, the typical ability of a competent person. Some measuring instrument has not existed – until now. Its name is Perspective Text Analysis and is the main constituent of the research reviewed here and the program proposed. Perspective Text Analysis has been applied in various learning environments and the results have shown the way in which persons in different functions adapt their thinking and action to the situational constraints. Such a constraint is reducing a person's quality of life considerably. Studies have made it evident, however, that a society may have a high quality of life, even though it may not seem so on the social surface. Those citizens, who conceive of the deeper dimensions of a society are competent and can provide their society with competence, transformed to quality of life. By means of theoretically founded models of social systems other studies have illustrated that (1) various models will be differently comprehended by different individuals and groups. They also show that (2) the comprehension of social properties is not the same when the model society is presented in the form of pure literature but (3) may be developed through training. A conclusion of import to the continuous work is that it is the quality in the instructional materials that will be crucial for competence development. Against this background the purpose of the proposed program for competence development is to analyse text materials as to their conceptual relations, so that they can be governing in learning situations. A hypothesis is that the quality of a learning environment is independent of external factors. It is the materials that constitute that environment. A theory of the construction of materials for the humanities and social sciences is proposed as a new field of research. The starting-point for studies in the new scientific field is a test material, which contains texts that are grouped according to degree of difficulty in comprehension (level). The degrees are connected to three commonly accepted scientific models, which build on the conceptual relations of the Behaviourism, the Cybernetics, and the Gestalt psychology respectively. Texts related to the models have been analysed in depth and specified as to quality. The materials thus fixed were then compared to texts written by students, with the purpose to define the student's knowing or competence, since there is a theoretical ground for it. By means of the theory of materials construction the effects of a learning process can be made explicit, that is what somebody knows. The final part of this article gives some examples of prototypical studies, of which the results will be concluded. They show some possible lines to follow when one wishes to introduce a humanistically based theory of materials into various learning and judgement situations.

214. Helmersson, H., & Mattsson, J. (2001). Demonstrating Pertex: A new method for improving text interpretation. *Field Methods* (formerly Cultural Anthropology Methods), *13,* (2), 115-136.

Abstract
This study demonstrates a new text analytic approach based on the PC-system Pertex. Interview data, obtained by use of the Critical Incident Technique (CIT) interaction with a commercial start-up in international telecommunications were used as text input. Analysis of such a CIT text resulted in a root concept that appeared to capture the essence of the text. This root concept was compared with the results of eighteen different written interpretations of the interview made independently of one another. These interpretations, taken in random order, were aggregated to a singular text. A separate Pertex analysis of the aggregated text resulted in the same conceptualization

and the same root concept as derived through analysis of the internal text. This is seen as supporting the validity of the approach and as indications of abilities for enriching the rigor of qualitative research by use of Pertex. The results point to the possibility of capturing the essence of a phenomenon from interpretations of it, made by different persons.

215. Mattsson, P. (2001). *Perspektiv på tillväxt - en studie av småföretagares tillväxtintentioner (Perspective on growth - a study of entrepreneurs growth intentions)*. Lund: Lund University, Department of Business Administration. (Licentiate thesis)

Abstract
The overall aim of this empirical study is to develop concepts for furthering the understanding of how small-firm owners think about growth. The study consists of eight small-firm owners who have applied for state subsidy for their firms. The small-firm owners describe how they perceive their firm, the small-firm business climate, the future, and growth. Perspective Text analysis is used to analyse the stories. This is done with the help of the computer-based program PERTEX Language that comes partly from the stories of the small-firm owners and partly from the use of Perspective Text analysis plays an important role in the study. Categories of growth intentions have been created from the analyses and interpretations of the stories related by the small-firm owners. Institutionalised growth is identified as a vision of the future. It consists of both a winning scenario and a threatening scenario. Pragmatic growth is identified as the individual's creation os space. It can be space for idea development, space for money & status and/or space for security & control. To gain an understanding of the small-firm owners' growth intentions, the intentions identified are related to the small-firm owners' perceptions of their situation. Some of the small-firm owners focus on possibilities while others concentrate on problems. This indicates that there are possibility seekers as well as problem enhancers among the small-firm owners. The identified growth intentions and perceptions of the small-firm owners are related to firm's employment potential. Possibility seekers have a greater employment potential than problem enhancers. This is valid primarily for possibility seekers whose growth intentions are aimed at providing space for idea development and/or space for money & status.

216. Trosslöv Aronsson, A. (2001). *How do consumers read an ad? A new approach to test advertisements*. Lund: Lund University, Department of Business Administration. (Licentiate thesis)

Abstract
Advertising is a complex issue, for example, due to the different ways in which an advertisement can be read. This means that it is both difficult and complex for advertisement senders to successfully communicate advertisement messages, i.e., to receive advertisement responses that are congruent with the intended message. The notion that both people and contexts are continually changing underlines the importance for advertisers to test advertisements in order to keep track of changes in, for instance, norms and values. This book proposes a new approach to test advertisements that generates knowledge about various kinds of consumers' advertisement readings. The proposed approach is based on the method Perspective Text Analysis that is operated in the PC-system Pertex. With the new approach

advertisement readings are grouped in an inductive manner with regard to how consumers freely voice their advertisement readings. This novel approach can be used to get a preview of consumers' advertisement readings and responses in general, or those of the target group(s) in particular, with regard to a specific advertising campaign. The study tries to expand theories on VOs structure and management in order to overcome the above mentioned problems of VOs. From the study it was found that individual expectations of members in a VO were of importance for the well being of members. Conflicts viewed by members of their initial expectations (mismatches) could lead to disappointment, less work motivation and even leaving the VO. Expectation matches and mismatches can affect learning and through learning, expectations can be more explicit and revised. Expectation management could solve part of the conflicts in initial expectations. Finally, several inhibitors of learning were found in the VO, i.e. gaps between industry and academia and between different academic disciplines inhibited learning in the VO.

217. Bierschenk, B. (2002). The information in the folds of the complex adaptive landscapes of a verbal expression. *Kognitionsvetenskaplig forskning,* No. 82; 0281-9864. (ED 462 408)

Abstract
The present article is advancing the bio-kinematic hypothesis that the Agent-action-Objective (AaO) axiom constitutes the only valid foundation for a behavioural expression of the informational dimensions contained in natural language. Based on the bookkeeping capacity of the discovered AaO-mechanism it is shown that this mechanism can capture emergent [AaO] units and track their growth in complexity. Through individual variations in the growth of the components as well as the variations in nesting, it is demonstrated that structural stability and textual morphogenesis is generating corresponding informational invariants. Furthermore, on the basis of the translation function, it is shown that the sequential translation of an original English text to Swedish and Swedish to Italian is producing the condition for an effective control of the interplay between textual agents (A) and textual objectives (O) within a system of language specific coordinates. Based on coordinated structural invariants, it is shown that convoluted structures are pointing toward the presence of a biologically determined interplay between a produced perspective and stated objectives.

218. Bierschenk, B. (2002). Real time imaging of the rotation mechanism producing interview-based language spaces. *Kognitionsvetenskaplig forskning,* No. 83; 0281-9864. (ED 465 812)

Abstract
The present article is advancing the bio-kinetic hypothesis that the complexity and non-linear dynamics of language can be approached on the basis of the Agent-action-Objective (AaO) paradigm. Experimentally it is shown that the derived [AaO] units rotate and that the AaO-governed rotations are including functions that can be imagined in real time, provided that a dot, marking the state of a rotating string, can be attached to the string. In using filled and unfilled dots, it is demonstrated that the stepping function of the discovered rotation mechanism is working within single [AaO] units. Through imaging the orientation of the dots on a sliding plane, it has been possible to demonstrate sliding over the A- and the O-domain and to measure

quantitatively the involved state changes. The experimental results are based on two samples. The first consists of an interview expression, which originally was produced in Swedish. The other sample relates to the translation of the original text into English. On the basis of this material, it is demonstrated that a system of [AaO] units has the capacity to keep track of rotations and assemble textual elements that temporarily are fitting into the structure, developed for a particular task.

219. Bierschenk, B. (2002). The observer as categoriser. *Kognitionsvetenskaplig forskning,* No. 84; 0281-9864. (ED 469 166)

Abstract
The article is a direct continuation of the experimental evaluation of the basic space-hypothesis as explored in "Real Time Imaging of the Rotation Mechanism Producing Interview-based Language Spaces". This has required that different parts, namely the spaces of the A- and O-domain, are being related and contrasted to one another. Now, in focus is the rotation-translation hypothesis. The present paper is demonstrating that the oscillations in pattern dynamics are producing perspective transformations of motifs and themes. Motifs are assumed to carry intentional cues and to locate structurally the observer's thematic orientation. At the kinematic level, this condition has made it possible to extract different perspective orientations. It is demonstrated that the asymptotic behaviour of evolving motifs provides the basis for a thermodynamic description of an original Swedish sample text and to compare the description with the dynamics induced through its translation into English. As a result, it is shown that the original and its translation share highly similar informational invariants. This means that their attractor spaces are structurally alike. With reference to the general recognition problems, the capacity to induce dynamics in another system and to demonstrate their similitude has meaning and important implications for further analyses and system synthesis.

220. Bierschenk, B., & Bierschenk, I. (2002). The AaO as building block in the coupling of text kinematics with the resonating structure of a metaphor. *Kognitionsvetenskaplig forskning,* No. 85; 0281-9864. (ED 472 170)

Abstract
The Agent-action-Objective (AaO) axiom and the theory of rotational dynamics constitute the frame of reference for the study of the metaphor as instrument for the direct perception of events. Its major hypothesis refers to the event structure embedded in the ground of a metaphor. Since the ground is implicit in the linguistic manifestation, an invariant representation of textual movement patterns is assumed to capture the event structure. Experimentally, it is demonstrated that an event is perceivable only through structure. To capture the event means to conserve its structure through informational invariants. As a result, it is demonstrated that the functional symmetry of a metaphor can be established in the form of state attractors evolving in attractor spaces.

221. Bierschenk, I., & Bierschenk, B. (2002). Structural sensibility as indicator of a learning strategy. In S. Beller (Chair), *Denken und Informationsverarbeitung (Thinking and information processing).* Symposium conducted at the 43rd Congress of the German Society of Psychology (DGP), Berlin, Germany. [Parts of the paper have been published in 2003 in *Kognitionsvetenskaplig forskning,* No. 86; 0281-9864.]

Abstract
Among educators at all levels there is awareness that teaching strategies should aim at developing students' ability to function adequately in known and unknown situations, which requires synthesis. However, in testing a presupposed ability, the tasks are mostly of the analytical kind. Synthesis is connected with structure, which implies that development of synthesis can only be studied through the structure of text production. People are variably sensible to the structure of educational materials. Therefore, a teaching strategy should aim at catching this variability and training students' sensibility to various structures. The paper presents a study in which students, classified according to high and low analytical performance, were given a reading and text production test to examine their sensibility to the structure of an Icelandic saga. This material was used because of its extreme simplicity on the textual surface level, a property suited for studying structure, i.e. what is beyond the surface. The hypothesis tested is whether the structure mediated through the produced texts pertains to a descriptive dimension (analytic sensibility) or to a reflective dimension (synthetic sensibility). The paper will demonstrate the extent to which a certain learning strategy may be governing in the pick-up and production of structure.

222. Bierschenk, B. (2003). Embodiment of consciousness. *Kognitionsvetenskaplig forskning,* No. 89; 0281-9864. [This work has been presented in C. Tarnai (Organiser of a Workshop on Perspective Text Analysis in 2003, June, at the Institute of Social Research (ISF) at the Westfälische Wilhelms University in Münster, Germany.]

Abstract
The present article is based on the premise that mind is an emergent property of the processes that produce consciousness. Any scientific understanding must necessarily consider the need of an explanation of consciousness. Instead, the non-sense property of traditional scientific modelling appears to hide the phenomenon. In contrast, the explored hypothesis is based on the assumption that the meaningfulness of natural language is the carrier of consciousness. This implies that the concept of natural must be considered as opposed non-natural or constructed concepts of consciousness. In a most fundamental sense, the study is discussing the differences between the nebulous constructs, traditionally classified as mental, and the emergence of consciousness as a property of the Agent-action-Objective (AaO) axiom. The underlying assumption is that consciousness is discoverable. Furthermore, it is assumed that the structural relations, forming the basis of discovery, are covered by textual surface properties, but are approachable with the introduced novelties of the AaO-model. In correspondence with the model, it is shown that a non-linearly working language mechanism is the key to consciousness. Further, the discovered mechanism appears to be responsible for dynamic change, flow and rhythm, which are producing the complex structures of text. It is this complexity and its capacity to reflect synthesis that constitutes the challenge for the establishment of the structural invariants of consciousness. The present article demonstrates that this problem can been solved in geometrical terms. Further, it is demonstrated that the developed method has the capacity to reproduce the spaces of a particular verbal statement and to establish its shapes. Finally, it has been of crucial importance that a test of the basic experimental space-hypothesis builds on an uncovering of those kinds of order parameters that are constraining the production space of a traditional model builder. It is shown that the presented approach has this capacity and that experimentation with a single statement can be based on the

manifestation of the corresponding states of knowing. The significance of the experiment lies in the determination of the involved state attractors of intention and orientation.

223. Bierschenk, B., & Bierschenk, I. (2003). Shapes of mind: Textual embodiment and thermodynamic description. Poster session at the *64th Meeting of the Arbeitsgruppe für Empirische Pädagogische Forschung (AEPF)* in Hamburg, Germany.

Abstract
This presentation is based on the premise that mind is an emergent property of the processes that produce natural language expressions. It is therefore assumed that the shapes of mind can be discovered through the structural relations that are forming the language spaces. However, these relations are covered by textual surface properties. Nevertheless, they are approachable with the introduced novelties of the method of analysis, namely PTA-Version VERTEX. This method is treating language as a self-referential system, that is, language production is looked upon as something that works according to natural law. The produced relations become structured through the internal driving forces of a biological clocking mode. Due to the Agent-action-Objective axiom it has been possible to discover the underlying mechanism. Hence, the algorithmic working of the AaO mechanism is responsible for the textual embodiment of the shapes and for the emergence of various orders of complexity. It has been made evident that the mechanism shows how individual variations in growth generate corresponding informational invariants, which can be named and communicated. The meaningfulness of the space hypothesis is experimentally validated in that distinct shapes evolve and reflect individual differences in sensibility to structural change. In an experiment carried out within a natural context, students' ability to function adequately in known and unknown situations respectively has been demonstrated with an evolutionary – developmental approach. Usually, in testing a presupposed ability, the tasks are mostly of an analytical kind, although adequate functioning in especially unknown situations requires synthetic ability. Synthesis is connected with structure, which implies that its development can only be studied through the structure of text production. The method used has been proved to meet this requirement perfectly. Three developmental studies have been carried out, which are based on the classification of (1) analytic-descriptive and (2) synthetic-reflective sensibility. Two students have been discerned and used in the validation of the space hypothesis. Since people are variably sensible to the structure of educational materials, three kinds of materials have been used to which the students had to respond in the course of a naturally given educational program. The major outcome shows that the structure mediated through the students' responses (produced texts) to the three materials pertains either to a descriptive dimension (analytic sensibility) or to a reflective dimension (synthetic sensibility). This individual ability to apprehend structural information remains over time. Hence, the individual attunes his perceptions in agreement with the predetermined order of an analytic or a synthetic mind.

224. Bierschenk, B., & Bierschenk, I. (2003). Manifestation of symmetry between the emergence of consciousness and the development of competence. *Kognitionsvetenskaplig forskning,* No. 86; 0281-8864. (ED 472 156)

Abstract
The article presents an experiment in which students, classified according to high and low analytical performance, were given a reading and text production test to determine their sensibility to the structure of an Icelandic saga. This material was used because of its extreme simplicity on the textual surface level, a property suited for studying structure as something beyond the surface. The hypothesis tested is whether the structure mediated through the produced texts pertains to a descriptive dimension, implying analytic sensibility or to a reflective dimension, indicating synthetic sensibility. Hence, the aim with the experiment has been to demonstrate the extent to which a certain learning strategy is governing the pick-up and production of a particular structure. Since synthesis is connected with structure, it implies that synthesis can only be studied through the structure of text production. In advancing the bio-kinetic hypothesis that the complexity and non-linear dynamics of a produced discourse can be approached on the basis of the Agent-action-Objective (AaO) paradigm, it is shown that the derived [AaO] units rotate and AaO-governed rotations are including A- and O-functions that can be imaged in real time. On the basis of two discourses concerning the Icelandic saga, it is demonstrated that a system of [AaO] units has the capacity to keep track of rotations and to assemble textual elements that fit into the structure of a particular text. Discourse (A) has been shown to produce a state space in which the terminus, associated with the global state attractor, communicates an inevitable course of events, while the other (B) communicates boldness as final outcome. Thus, the results of the experiment make evident that significant differences in emergent consciousness are crucially dependent on structural sensibility and the developed learning strategies.

225. Bierschenk, B., & Bierschenk, I. (2003). Individual growth in competence. *Kognitionsvetenskaplig forskning,* No. 87; 0281-9864. (ED 482 284)

Abstract
This article presents the second study in a series that has been designed to manifest the emergence of consciousness and to measure developed competence. Its major aim has been to demonstrate that an invariant formulation of the Agent-action-Objective model and an analysis of its A-O kinematics have the capacity to re-produce contour similarity over time. Within the studied evolutionary-developmental context, the bio-kinematics of the discovered AaO-mechanism has governed the synthesising of information. Through the design of a single-subject experiment, it has been possible to demonstrate individual variations in growth as changes in complexity. When the two participating students are compared, obvious differences in their perspectivation, and consequently in their attractor spaces, become apparent. Based on coordinated structural invariants, it has been possible to show that the convoluted spaces of the student, who has followed the analytic-descriptive approach, is concerned with the concrete level of the tested story. On the other hand, the student, who is following a synthetic-reflective strategy, seems to concentrate mainly on the symbolic level of the tested materials. Thus, from the developmental point of view, it has been possible to demonstrate that the AaO-mechanism is tracing embodied growth, which becomes manifest in the differences of the students' ability to adapt to the main idea of the given story.

226. Bierschenk, B., & Bierschenk, I. (2003). Evolution of growth in the development of competence. *Kognitionsvetenskaplig forskning*, No. 88; 0281-9864. (ED 482 285)

Abstract
The article presents the third study of a series that has been designed to manifest consciousness and to measure developed competence. The emphasis of the main hypothesis of the present experiment has been put on the student's ability to adapt to the main idea of a given story and to express his comprehension verbally. In what way the two students of the previous two experiments have been able to accomplish the experimental task, is reflected in the state attractors of the produced fitness landscapes. The student, who has continued to follow the analytic-descriptive approach, has focussed on the conditions of that part of the story that relates to a critic of empiricism. Since it has been shown that the process of naming the resulting state attractors provides a sound theoretical basis, it can be concluded that the student has not been conscious of this purpose and consequently been unable to abstract the criticism of empiricism. In contrast, the other student has continued to follow the synthetic-reflective approach. The produced narrative has made evident that this student has been able to abstract the criticism of idealism. It follows that the proper outcome is "rationalism", which is validating that the degree of developed competence can be approached in a direct and obvious manner.

227. Bierschenk, B. (2004). Transformation of a word model: String rotation and pattern dynamics in the production of abstract geometric spaces. *Kognitionsvetenskaplig forskning,* No. 92; 0281-9864. [Presented at the *65th Meeting of the Arbeitsgruppe für Empirische Pädagogische Forschung (AEPF)* in Nürnberg, Germany.]

Abstract
On the basis of the Agent-action-Objective (AaO) paradigm, it will be shown how the transformation of a word model to a geometric space description can be made the foundation for an approach to informational invariants. In particular, it will be demonstrated that the word model of a causal loop diagram can be used for simplifying the involved procedures. Since the explanation of a causal loop requires a verbal description of what is in the links, this kind of discourse is necessarily dependent on its producer's intention and orientation. Both can be discovered through the functional geometry of non-linearly working language mechanisms. Although covered by textual surface properties, corresponding language spaces are approachable with VERTEX, which is a new version of Perspective Text Analysis (PTA). Moreover, reproduced order parameters are the result of the strict dependencies, which are characteristic of the entangled [AaO] units of the (AaO) model. Relative phase stability in the developing variables (α) of the A-component and (β) of the O-component of the model has revealed that VERTEX has the capacity to manifest the structural symmetry of the emerging A- and O-strands. Furthermore, the overall symmetry of the strands is a consequence of apparent super-string disparity, which has important theoretical implications.

228. Bierschenk, B., & Bierschenk, I. (2004). Heterogeneity in the apprehension of adaptation and justice. *Kognitionsvetenskaplig forskning*, No. 91; 0281-9864.

Abstract

The present report is about the fourth experiment in a series of five. This series concerns a longitudinal study of changing shapes of mind. Based on the assumption that mind is an emergent property of the processes that produce natural language expressions, mental development is discoverable through the Agent-action-Objective (AaO) mechanisms forming language spaces. These are approachable with Perspective Text Analysis (PTA). The present study is focussing on the way in which the evolutionary process of text production portrays the system of thought that holds that human fitness can be explained on the basis of progressive adaptation. In what way this idea has been apprehended from Strindberg's drama play (Miss Julie) and to what degree it has been embodied into the students' discourse, has been studied in the natural context of an educational program. The mediated structures show a clear-cut result. It is the individual perspective that has emerged out of the verbal flow. In one perspective appears the social aspect of the play, while the naturalistic aspect is dominating the other. This result confirms previously made observations: The social aspect pertains to a descriptive dimension. The extraction of the naturalistic aspect has been shown to be dependent on a reflective dimension. Finally, this individual ability to apprehend one or the other form of structural information confirms that the individual attunes his perceptions in agreement with the predetermined order of an analytic or a synthetic mind.

229. Bierschenk, B., & Bierschenk, I. (2004). Intuitive judgement in the context of constructivism. *Kognitionsvetenskaplig forskning*, No. 93; 0281-9864.

Abstract

This report presents the fifth and last experiment in a longitudinal study of text building behaviour at the Gymnasium level of a Swedish School. The series of experiments concerns natural language production as a means for the establishment of state attractors as well as their geometric space descriptions. The hypothesis tested during three years of instruction and learning is whether the evolving attractors pertain to a descriptive dimension (analytic sensibility) or to a reflective dimension (synthetic sensibility). In the present context, it has been anticipated that a text on a utopian society can be used for the purpose to show that the produced space descriptions concern the general principles of reason. On the basis of the written responses to Huxley's "Brave New World", it is demonstrated that analytic sensibility results in state attractors, which are manifesting a focus on the dimension of right or wrong. In contrast, synthetic sensibility appears to be a source for the emergence of state attractors that concern the effects of an extreme utilisation of humans.

230. Bierschenk, I. (2004). Testing for synthesis. *Kognitionsvetenskaplig forskning,* No. 90; 0281-9864.

Abstract

This article connects to the present day awareness of educators at all levels that the methods for measurement and testing of knowledge have to be reconsidered and modernised. For it is not the definition of knowledge that has changed since the 1968 student revolution; what has changed is how it is valued. Moreover, the general opinion among educators is that knowledge is the result of the student's analytical ability. Therefore, the tasks of examination are mostly of the analytical kind. However, teaching strategies are very often adapted to project work and overviews of subject

domains, which requires thinking in holistic terms. A consequence of these changes is that they presuppose testing for synthesis. Since synthesis implies that the student is sensible for structural clues, this kind of testing must unconditionally be based on the student's production of text. A study of concept understanding could show clear indication of an awareness of structure, but the kind of structure remained unknown. The presented approach for testing synthesis is based on Perspective Text Analysis (PTA), which is founded on the Agent-action-Objective paradigm. The demonstrated test results are an illustration of what kind of structure a particular synthesis is based on. In order to make an underlying structure manifest and the resulting synthesis knowable, it is, however, necessary to take specificity and uniqueness into account. Therefore, rules of performance, typical for intelligence tests are of minor import. Instead, it is the single student's perspective – his synthesis – that emerges out of the verbal flow in the produced text.

231. Bierschenk, I., & Bierschenk, B. (2004). Diagnose der Leistungsheterogenität durch die Perspektivische Textanalyse: VERTEX (Diagnosing heterogeneity in achievement by means of Perspective Text Analysis: VERTEX). In: W. Bos, E.-M. Lankes, N. Plaßmeier, & K. Schwippert (Eds.), *Heterogenität: Eine Herausforderung an die Bildungsforschung (Heterogeneity: A challenge to educational research),* (pp. 16-28); 3-8309-1393-1.

Abstract

The basic hypothesis of the presented contribution is that mind is an emergent property of the processes that produce natural language expressions. The shape of the mind of a particular person can be discovered through the mechanisms forming the corresponding language space. Although covered by textual surface properties, this space is approachable with VERTEX which is a new version of Perspective Text Analysis (PTA). Due to the Agent-action-Objective (AaO) axiom, it has been possible to discover the underlying biological clocking mode of language production. Hence, the algorithmic working of the AaO mechanism is responsible for the textual embodiment of the shapes and the emergence of various orders of complexity. The space hypothesis is validated in that distinct shapes evolve and reflect individual differences in sensibility to structural change. In an experiment within a natural context, the heterogeneity in the students' ability to function adequately in known and unknown situations has been demonstrated with an evolutionary-developmental approach. Especially unknown situations require synthetic ability. Thus, synthesis, as connected with structure, can only be studied through the heterochrony of produced text. A longitudinal study is in progress and some results of the first experimental outcome have been used to illustrate the validity of the basic hypothesis. This approach is based on the classification of (1) analytic-descriptive and (2) synthetic-reflective sensibility. Two students have been discerned and followed. The kind of materials to which the students have responded has been used in the course of an educational program. The structure mediated through the students' responses pertains either to a descriptive dimension (analytic sensibility) or to a reflective dimension (synthetic sensibility). This individual ability to apprehend structural information appears to remain over time. Hence, the individual attunes his perceptions in agreement with the predetermined order of an analytic or a synthetic mind.

232. Bierschenk, B., & Bierschenk, I. (2004). Transformation of a word model to a geometric space description. Poster-session at the *65ᵗʰ Meeting of the Arbeitsgruppe für Empirische Pädagogische Forschung (AEPF)* in Nürnberg, Germany.

Abstract

The presentation connects to current trends and developments in the study of complex systems, non-linear dynamics and self-organisation with special emphasis on the self-referential properties of natural language production. Traditionally, the use of language presupposes that text can be broken into pieces, which can provide the elements for the construction of "word models". In seeking the most precise verbal description of a model, words used may look the same, still disagreement on their meaning may be both striking and difficult to resolve. Based on Perspective Text Analysis (PTA), it will be demonstrated that the method can account for the single individual's ability to know. Studying a single person requires that uniqueness can develop and become part of one's knowing. The new condition, to be specified in the presentation, is that 'textual pattern dynamics' is the outcome of a subtle interplay between intentionality and orientation for which the Agent-action-Objective (AaO) axiom provides the proper foundation. Conceived of as systems, it will be shown that the AaO's carry intentional cues and contain information about the produced orientation. In order to give weight to the hypothesis that rotational dynamics is basic to the effects of selective textual movements, 'phase transitions' are demonstrated. The structural significant aspects of their information will be captured conceptually in the corresponding contours of "fitness landscapes".

233. Bierschenk, I., & Bierschenk, B. (2004). Demonstrating the limits of growth in competence, presented by I. Bierschenk in U. Trautwein (Chair), Symposium on *Unterricht und Lernen (Instruction and Learning)* at the *65ᵗʰ Meeting of the Arbeitsgruppe für Empirische Pädagogische Forschung (AEPF)* in Nürnberg, Germany. [Details of this study have been published in 2005 in *Kognitionsvetenskaplig forskning*, No. 95; 0281-9864.]

Abstract

Educators at all levels are aware that teaching strategies should aim at developing students' ability to function adequately in known and unknown situations. Especially the latter ability requires synthesis, which is the most fundamental prerequisite for competence development. However, in testing a presupposed ability, the tasks are mostly of the analytical kind, which is connected with qualifications. Synthesis, on the other hand, is connected with structure, which implies that development of synthesis can only be studied through the structure of text production. Since people are variably sensible to the structure of educational materials, a teaching strategy should aim at discriminating students with respect to this variability and training their sensibility to various structures. The purpose of this paper is to report on such a teaching strategy and its effect over time. Two students in a social science class were distinguished at the beginning of their gymnasium program, because they had shown a diametrically different sensibility to the various tasks of writing and reading, one pertaining to an analytic-descriptive dimension, the other to a synthetic-reflective dimension. At the first test after seven months of study, the two students were asked to produce in writing their understanding of the basic idea of a medieval saga material, which was part of the ordinary curriculum. As reported elsewhere, a structural analysis with the PTA method has shown that the student characterised by an analytic-descriptive

learning strategy produced a structure, which is very limited in growth, while the student who was learning by means of a synthetic-reflective strategy showed a more expanded structure. The educational program that followed in the class and ended by the third year was aimed at challenging the students' sensibility to literary texts with the purpose to stretch the limits of the individual growth of the students. The fifth and last test concerned the apprehension of the basic idea of a futuristic novel, which was part of the ordinary curriculum concerning 20th century modernism and its literary expression. Now, the intricate question is whether the conscious schooling program during three years had the capacity to stretch the limits of growth and thus to demonstrate changes in a student's competence profile. In fact, the structural graphs, which are defining the competence, had produced the same contours at the second, third, and fourth test occasion. At the fifth occasion after three years, the student characterised by an analytic-descriptive learning strategy shows a very restricted ability to grow in competence, while the student characterised by synthetic-reflective prerequisites is much more adaptive to the educational program and shows an ability to extend the limits and thus to grow in competence. In sum, individual limits to growth in competence development have been demonstrated but whether schooling has contributed to the results is uncertain.

234. Gabrielsson, Å., & Paulsson, M. (2004). *Individ och agentskap i strategiska processer. En syntetisk och handlingslogisk ansats (Individual and agency in strategic processe*s: *A synthetic and action logic approach).* Department of Business Administration, Umeå School of Business and Economics. Umeå: Studies in Business Administration, Series B, No. 55; 91-7305-802-5. (Doctoral Dissertation)

Abstract
Even if strategy research often assumes that strategies are the result of intentional and purposeful behaviour the individual and human agency has tended to be neglected. Few empirical studies focus on how the individuals, their conceptions and actions interact with strategy formation. Based on ideas from process research and critical realism we made a review of the research and we maintain that the bulk of the research is based on simplified assumptions. We therefore propose a supplementary socio-cognitive approach based on more realistic assumptions, a synthesis and action logic approach, emphasising the individuals, the leading team and their embeddedness. In a process study with a comparative case study design we followed, in real time for about a decade, strategy formation processes in intermediate organisation in local economic development. Various methods of data collection and analysis were combined. By laying bare some of the mechanisms that explain the outcome in four processes we demonstrate the use of the proposed approach. A theoretical construction, the agent's strategic concepts of action (SCA, aims at capturing the conceptions as an expression of the individual frame of reference providing reasons for action. The SCA carries explanatory power and is significant for both the process and content of the strategies. A typology of the SCAs is developed. The composition, the interaction and the structure of the team are other central aspects. We conclude that a strong group well suited to lead a formation process include a proactive strategist with a strategic idea and social capability; the role constellation is differentiated, and supplementary and other strategic actors relate to the strategy and the contextual roots in a way that will support the strategy. We also demonstrate in which circumstances some cognitive, social and political mechanisms discussed in earlier research are activated.

235. Tjärnemo, H., & Ekelund, L. (2004, September). *Consumers choice of organic versus conventional fruit and vegetables - the role of the grocery store*. (ISAS Acta Horticulture, No. 655, pp. 115-120). XV International Symposium on Horticultural Economics and Management.

Abstract
This paper presents findings from two explorative studies. One is a consumer study based on interviews with consumers in real store settings and one is a study based on interviews with fruit and vegetable managers of stores affiliated with a major food retail chain in Sweden. The aim of both studies was to explore the role of the grocery store for the consumers' choice of organic versus conventional fruit and vegetables. The empirical data was analysed by using Perspective Text Analysis (PTA), an approach that aims at revealing the central message of a verbal or written text. The analyses showed that the main approach towards how to choose fruit and vegetables differed between consumers who bought and consumers who did not buy organic fruit and vegetables. While the first group was health-oriented, the second group was more meal-oriented. Organic fruit and vegetables were perceived as coherent with the first group's health-oriented buying approach, but as incoherent with the basic quality standards of the second group. The meal-oriented consumers perceived the grocery store as a source of inspiration for their meal planning, and for that reason the store could play a significant role by promoting organic alternatives. However, the study of fruit and vegetable managers indicated that grocery stores could not be expected to promote organic fruit and vegetables, since the fruit and vegetable managers considered organically grown to be of marginal interest from both a store and a consumer perspective. The two studies highlight one of the main difficulties that lie ahead of continues market growth of organic fruit and vegetables, i.e. how to reach the less devoted majority of consumers if the food retailers perceive organically grown as uninterested products.

236. Bierschenk, B. (2005). The morphogenesis of intention and structural stability of motifs. *Kognitionsvetenskaplig forskning*, No. 96; 0281-9864. [Parts of this work have been presented by I. Bierschenk at the *66th Meeting of the Arbeitsgruppe für Empirische Pädagogische Forschung (AEPF)* in Salzburg, Austria.]

Abstract
The strategy, presented in this article, is based on the Agent-action-Objective (AaO) axiom. The assumption is that intention can be discovered and made evident. But this requirement can be satisfied only under the condition that a particular individual can be identified with his style of writing. This implies that the nature of writing becomes approachable. Getting a style under control presupposes the A-component of the [AaO] model, which is discussed with a focus on string rotation and the establishment of lawful relations that include intention in laws that are governing the patterning of strings. It is demonstrated that angular articulations are characterising dynamical string movements. However, independent of their textually embedded magnitudes, they cannot survive. As the result of the text production of two Swedish students, convoluted structures have come into existence, which reflect transformations on the meaning of topological invariants. Thus, spaces have been realised, which have been shown to restrict string rotations. Over the given environments, it is demonstrated that uniqueness has been achieved in the comprehension of a particular task. In the

formation of motifs, the morphogenesis of intention and its structural stability have provided the basis for a 3D writing style control, while the growth curves of motifs have been shown to evolve in complex landscapes.

237. Bierschenk, B. (2005). Controlling limits for knowability. *Kognitionsvetenskaplig forskning*, No. 97; 0281-9864.

Abstract

The present article has been based on the string-hypothesis, which has important scientific consequences. Today, understanding of measurement and representation means to assign a number. Science in the statistical age of the 20th century has meant to associate the notion of number with the strict operation of counting. However, recent account of string-theoretical approaches and functional geometry, rediscovered by the space science, is sharply distinguishing "number" from "magnitude". In studying "spinning" strings in the context of evolutionary language dynamics, it is shown that string-rotation is a valid concept for the observation of different thermodynamic limits. For the description of rotating strings, super strings and super symmetries, fitness values have been produced during the generation of corresponding energy landscapes. Their significance has been founded on the hypothesis that distance is a function of rotational acceleration and that spinors have the capacity to carry rotating string composites of varying complexity. Finally, it has been made evident that the phase transition of a string from its virtual to its material state results in a super-fluid solid, which means that dissipation-less flows of kinetic energy is decreasing the symmetry of a string. Since spinors are controlling the flow, breaking the symmetry of a string allow for the establishment of dimensional asymmetries. As a result, the asymmetry of the dimensions of intention and orientation has been determined and their componental disparity has been made manifest in the global singularities of the underlying fitness landscapes

238. Bierschenk, B., & Bierschenk, I. (2005). Sustainability of authenticity. *Kognitionsvetenskaplig forskning*, No. 94; 0281-9864.

Abstract

Today, design is the concept of fashion. This article is focusing on the notion that there is one ideal design of society. The search for ideal solutions of societal problems has been the habit of utopianism. With the purpose to clarify how a student understands prescription and the design of a perfect society, a discourse on Huxley's "Brave New World" is studied. This implies that the student as text producer is expected to communicate a particular intention and orientation, since certain viewpoints are chosen and expressed intentionally. Intention presupposes that a particular perspective must be present throughout text production. Since the presented approach is founded on the controlling function of text production, founded on the Agent-action-Objective (AaO) axiom, it implies a two-fold and complementary description of the underlying structures. These structures are assumed to reflect noticeable structural invariance. It will be demonstrated that certain regions in the state spaces of the produced discourse can be manifested through the realisation of multiple trajectories. Their distinctiveness provides the condition for the treatment of the relation between autonomously developing landscapes of information synthesis. Concerning the constraining impact of Huxley's utopian society on the emergent state

attractors, it is shown that the termini of the attractors support information structures, which are coherent with an understanding of the emerging critical factors of disorder.

239. Bierschenk, I. (2005). The morphogenesis of orientation and structural stability of themes. *Kognitionsvetenskaplig forskning*, No. 95; 0281-9864. [Parts of this work have been presented at the *66th Meeting of the Arbeitsgruppe für Empirische Pädagogische Forschung (AEPF)* in Salzburg, Austria.]

Abstract

This article presents a longitudinal study of a comprehensive experiment carried out in a natural learning environment. Its issue has been to consider the relationship between development and growth by intra-individual comparisons. According to an evolutionary scale, pure literature has been selected in the course of a modular curriculum, developed for the Gymnasium level. With respect to the comprehension of the main idea of five literary works at five occasions during three years two students were asked for a spontaneously written response. The test occasions were embedded into the ordinary course. Five discourses have been processed in order to establish their language spaces and corresponding information structures. The analyses have laid bare the persons' potential for growing with the evolutionary materials. The essential result of the study is that the student, who is using a rudimentary and descriptive writing style, has produced restrained language spaces and correspondingly restrained informational structures. However, the contours of the spaces and their structural levels show, irrespective of the materials, stability in style. This result is discussed in contrast to the other student's writing style, which is reasoning, reflective and differentiated in relation to the materials. Finally, it is concluded that development is dependent on structural constraints within every single individual.

240. Mattsson, J. & Helmersson, H. (2005). Internet banking: modelling the e-competence of customers with a text-analytic CIT approach. *International Journal of Bank Marketing*, *23* (6), 470-483.

Abstract

The paper is aimed at modelling the e-competence of internet bank customers with a new text-analytic method. A web survey using a critical incident technique approach (CIT) and follow-up interviews was used to sequentially capture verbal accounts of the very first experience of users of a particular internet bank. Text analyses were carried out from the complete set of responses to the trigger questions to synthesise user accounts of these experiences. These verbal syntheses (as modelled by a Pertex text-analytic approach) are purported to illustrate e-competence. A diverging pattern of e-competency was found. One group of customers was able to handle the web site and the other group felt abandoned and was not able to adopt technology. The study comprised a limited sample of Danish first-time internet bank customers. Therefore, generalisations should not be drawn as to the competencies of bank customers. Further research could encompass much larger and broader samples and be focused on a particular internet function or e-service. Findings suggest that some customer groups may have difficulties in applying new technology and that these groups may have special needs of support in the start-up period. The value of the paper is that it illustrates a new kind of text analysis that can summarise divergent texts and thereby distinguish between different kinds of user competence in a meaningful way.

241. Helmersson, H. & Mattsson, J. (2007). Food product development: A consumer-led textanalytic approach to generate preference structures. *British Food Journal*, *109* (3), 246-259.

Abstract

This paper aims to illustrate a new method to cluster consumer attribute preferences and to transform spontaneously written texts by consumers about a certain favourite food product (hamburger) into distinct preference clusters of attributes. A new way of finding significant clusters of consumer attribute preferences is developed by means of a new text analytical approach (Pertex) and a multi-step two-sided cluster analysis procedure. Clear linkages were ascertained between four respondent and four preference clusters for the two key product dimensions taste and ingredients of the hamburger. Clusters expressed were in close conformity to the conception of the standard hamburger. Only one student sample was used. A new and practical method to transform written text into distinct consumer preferences (segments) was tested using a multi-step cluster analysis to support food innovation in the food industry. Product dimensions were integrated in a meaningful way into distinct preference clusters that could be used to segment consumers when innovating new food products.

242. Helmersson, H. & Mattsson, J. (2007). Eating fast food: attitudes of high school students. *International Journal of Consumer Studies*, *31* (1), 117-121.

Abstract

Alarmingly consistent recent research shows that industrially produced foods such as fast food contain compounds that add to obesity and high cholesterol among young people. Less physical activity and a higher propensity to eat ready-made food (in Sweden and internationally) have aggravated the health situation for the young generation. They also have become `addicted' to sugar by the consumption of lemonade and other sweet drinks that are often served in conjunction with fast food. Food consumption patterns are highly cultural, and, once formed in early years, they become difficult to change. The findings of this study, which was based on a small sample of written accounts and transcribed interviews, indicate that high-school students in Sweden are well aware of the good and bad attributes of fast food, such as: speed, convenience, fat and sugar. Clear differences in attitude were found between male and female students: female students view fast food in a broad food chain context, whereas male students concentrate on fast eating and satiety.

243. Hine, D. C., Helmersson, H., & Mattsson, J. (2007). Individual and collective knowledge: An analysis of intellectual capital in an Australian biotechnology venture using the text analytic tool Pertex. *International Journal of Organizational Analysis*. *15* (4), 358-378.

Abstract

The purpose of this paper is to focus on the need in biotechnology to integrate a variety of knowledge bases to build the intellectual asset base of the commercial entity operating in the biotechnology industry. The paper is based upon a single case study of a young biotechnology company, itself relying on the knowledge and expertise of four directors. To analyze the responses of the four directors to a single lead question, designed to prompt the respondents to articulate the intellectual capital they offer to

the firm, this study employs a novel text analytical tool known as Perspective Text Analysis (Pertex). The results show the disparate nature of the individual knowledge sets in contributing to the interdisciplinary base of the firm. The combined analysis illustrates the importance of collective intellectual capital through "sustainable collaboration." This study employs a novel analytical tool to undertake an analysis of both individual intellectual capital and collective interdisciplinary contribution using data from a single question. Pertex is a valuable tool in analyzing the intentionality of a respondent by cutting through to the true essence of their response.

244. Ulvenblad, P. (2009). *Growth intentions and communicative practices*. Lund Studies in Economics and Management, No. 109. Lund Institute of Economic Research. Lund: Lund Business Press. (Doctoral dissertation)

Abstract
This thesis focuses on the "will and skill" of individuals who take part in activities of running a business. The aspect of "will" is studied in terms of growth intentions and the aspect of "skill" is studied in terms of communicative practices. The overall purpose is to explore how entrepreneurs think and talk about growth and how they act in their communicative practices to express their growth intentions and to mobilize resources for their businesses. To meet the overall purpose four empirical studies have been conducted. The empirical data consist of interviews and observations "shadowing" entrepreneurs, as well as mail questionnaires to Swedish entrepreneurs. Perspective Text Analysis (PTA) has been used to analyse growth intentions, and reveals growth in both a pragmatic sense and an institutionalized sense. Pragmatic growth refers to talk about growth in terms of space for development, space for money and status, and/or space for security and control. Institutionalized growth refers to talk about growth in terms of a winning scenario or a threatening scenario. The analysis regarding communicative practices resulted in six categories of communicative behaviour in the business start-up: (i) from no one to someone, (ii) from small to big, (iii) from inexperienced to experienced, (iv) from one role to another role, (v) from alone to a network member, and (vi) from silence to conversation. Further, the entrepreneurs show other-orientation, openness and adaptation in their communicative behaviour. In addition, entrepreneurs with previous experience from entrepreneurship education report higher willingness in the dimension of openness and adaptation in communication. The communicative practices are merged into a model of content-centred, behaviour-centred and adaptive-centred communication strategies. Entrepreneurs' "will and skill" with focus on communication strategies are proposed to be an important part of strategic entrepreneurship.

7. Methodological Observations about the Scientific Use
of Language in the Behavioural and Social Sciences

7.1 Final Remarks

1. The general opinion among both grant providing agencies and scientists as well is that all kinds of research should be made public through internationally refereed journals and scientific meetings. However, this is an idealisation of the state of affairs at least in the Behavioural and Social Sciences.

2. The generally available research methods are effectively raising barriers for this endeavour. Additionally, methodological obstacles contributed to Social Science research are due to its extreme dependency on language production. Everybody is speaking about the importance of the dynamics of language, but nobody knows what that means in practice. Thus far no one has been able to make the dynamics of language visible, for example through the imaging a verbal flow. Furthermore, it has been inconceivable how a verbal flow can be made the foundation for comparative international studies e.g., in connection with studies of competence development.

3. The international discussion gives evidence for the fact that all parties involved are conscious of the importance of language in the study of mind and behaviour. But as soon as social scientists or technologists are studying human interaction with various environments, it becomes obvious that the human factor is observed and analysed as if it were an object. Independent of the researchers' interests in human conditions, these become also in an international perspective unconditionally reduced to a study of objects. This is so because their research methods are object-oriented and thus governing the outcome correspondingly. Hence, when the prevailing understanding of text dynamics is coupled with the judgement of quality, the consequences become severe. Moreover, this entanglement becomes even more trying when language boundaries have to be crossed.

4. As long as the "dynamics" has not been demonstrated in other ways than through the development of measurement devices that can only give response in the form of a catalogue of social indicators, at times called value criteria, and the establishment of relations between mean values, comparative international studies remain behind "Venetian Blinds". A future oriented development of internationally meaningful approaches requires that specificity and consequently uniqueness in mental development constitutes the foundation of study, if internationalisation shall be taken seriously. Understanding of the quality of a text, based on the reader's intuition or potential classifications, has no scientific value.

5. A common opinion or at least a locution is that the composition of a text and other surface oriented properties are its structure and consequently the markers, which make its dynamics perceivable. However, only if text is treated as a biological expression, a methodological foundation can evolve that allows for the crystallisation of what is unique in the single individual's mental development.

6. Since the method of Perspective Text Analysis (PTA) has been anchored at the biological-physical level, it provides a sound scientific basis for the establishment of international studies in the real sense. The biological foundation of PTA has made it possible to demonstrate the dynamics of textual pattern movements and to visualise manifested courses in the form of holotops and holophors. Especially the holophor gives expression to demonstrated structural commonalty between different languages and language families. This kind of sameness cannot be read out from the surface of a produced text.

7. In order to visualise a person' s potential for "knowing" he lives in and to make the application of PTA accessible in the context of international research, it is necessary to make the emerging "energy landscapes known. Since the holophors constitute the framework for the topological invariants and the description of attractor spaces, they are the means for alternative descriptions of the themes of a text and its underlying motifs. Finally, the reported research activities are aimed at specifications of what "knowing" implies at various levels both nationally and internationally.

7. Index